

# THE IRON AGE

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PAGE 26



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# THE IRON AGE

New York, Thursday, June 11, 1908.

## The Wheeling Electric Induction Clutch.

Heavy machinery that must be frequently and quickly started and reversed should, for many reasons, be driven by a continuous running motor through reversing clutch gearing rather than by a reversible motor. The more frequent the reversing and the quicker the acceleration demanded, the more pronounced are the advantages. This contention assumes that the clutch mechanism used is ideal in regard to wear, heat dissipation, ease of con-

clutch gearing uses its own inertia to advantage during acceleration and reverse of driven machinery, hence the larger the motor the less the danger of overload other things being equal. Furthermore a continuous running motor with a drooping speed characteristic, when used with clutches of proper design, smooths out the load curve by utilizing flywheel energy during the short periods of acceleration and reverse of driven machinery. This

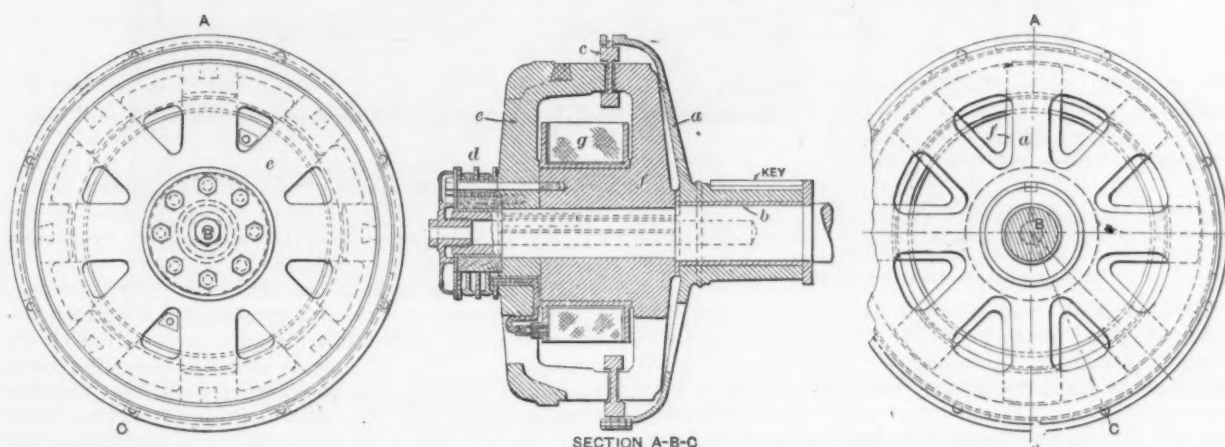


Fig. 1.—Details of the Electric Induction Clutch for Driving Reversing Machinery, Made by the Wheeling Mold & Foundry Company, Wheeling, W. Va.

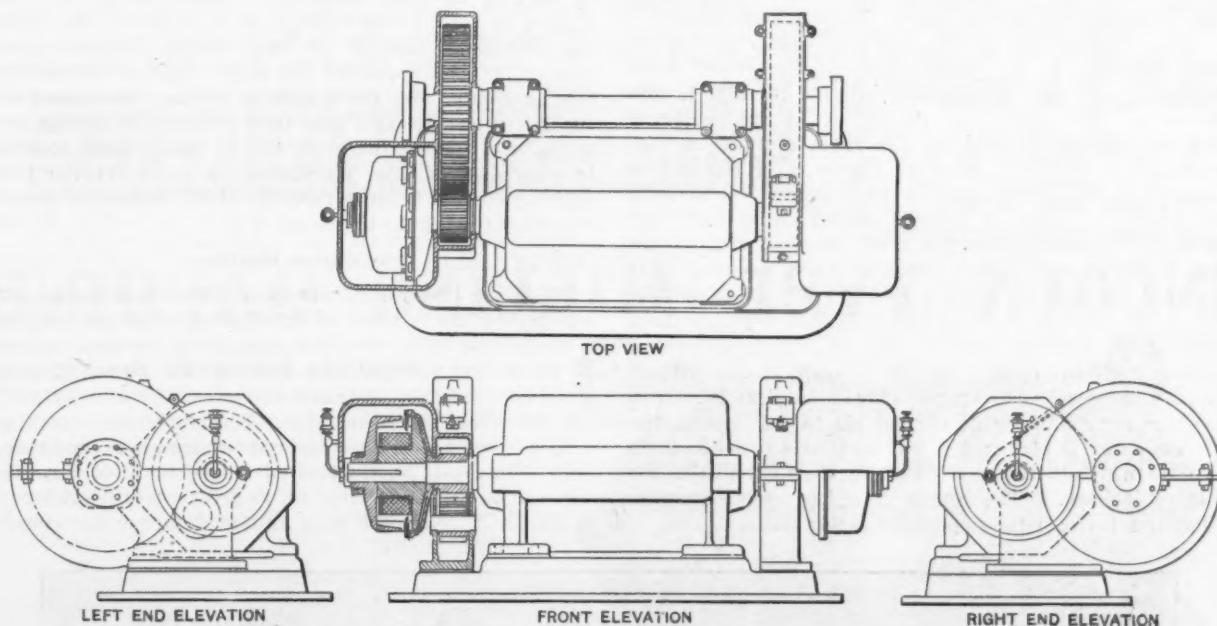


Fig. 2.—A 50-Hp. Reversing Drive for Rolling Mills, Showing the Wheeling Clutches Combined with a Crocker-Wheeler Motor.

trol, simplicity of construction, and relatively low inertia of reversing parts.

### Nonreversing Motor Advantages.

The reversing motor has the disadvantage of having to overcome its own inertia at start and stop in addition to that of the driven machinery. This not only puts an additional load on the motor but limits the size of motor that can be used if quick reverse is required, because the larger the motor the longer the time required to reach full speed without overload, simply on account of armature inertia. For this reason the trouble is often increased by replacing small motors with larger ones for driving quick reversing tables. On the other hand a continuous running motor doing the same work through

smoothing-out feature may be carried to any desired degree by providing sufficient flywheel capacity in the continuous running members.

A direct current reversing motor, unless it has commutating poles, is at a disadvantage by perforce having its brushes set at a point midway between the most advantageous points for forward and reverse rotation. This amounts to little where the motor is not heavily loaded, but it becomes significant when the motor is working under full load or over load in either direction.

Controllers for quick reversing motors, and especially for large motors in the hands of presumably careless and ignorant operators, which can be considered thoroughly satisfactory have not yet appeared and probably never

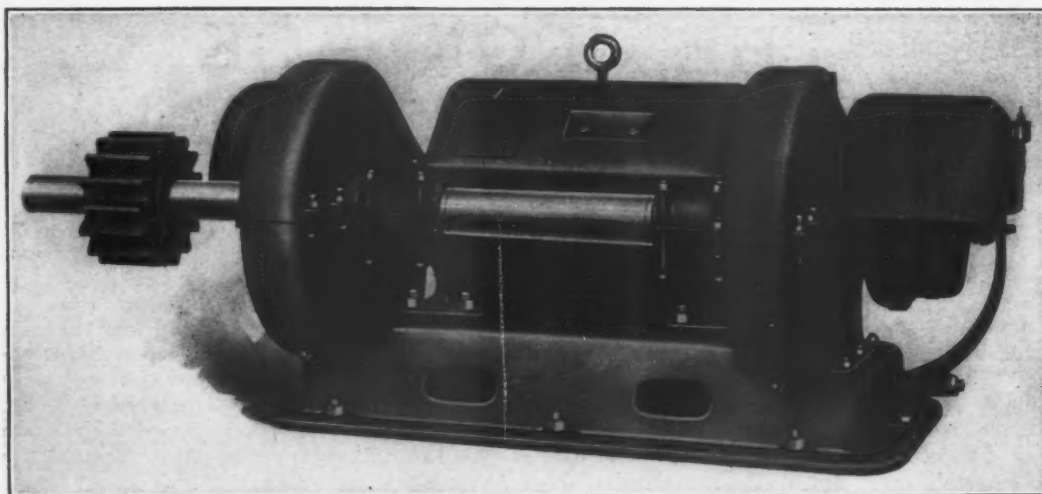


Fig. 3.—A Photographic View of the Drive, Drawings of Which Are Given in Fig. 2.

will if simple construction is regarded necessary. There are controllers which under favorable conditions protect the motors, but they are complicated, involving solenoids, plungers, contacts for making and breaking full-load motor current, interlocking devices, circuit breakers, &c., requiring care to maintain their adjustment, frequent renewal of parts, and an expert to keep them in condition.

#### The Induction Clutch.

A continuous running motor, used with the electrical induction clutch gearing made by the Wheeling Mold and Foundry Company, Wheeling, W. Va., can be started under no load and requires no controller except an ordinary starting box. The motor as well as the clutch gearing and driving machinery, because of properties inherent in the clutch, are protected against careless handling. In addition to being simpler and more fool-proof, this drive insures quicker acceleration on account of not having to handle the high inertia of the motor armature.

The construction of the clutch is shown in Fig. 1, and examples of its applications in the other illustrations. In the longitudinal section in Fig. 1, the relatively light spider *a*, containing at its center a bearing bushing *b* loose on the shaft and at its circumference holding a ring of copper *c*, is the driven member of the clutch, which may deliver power directly or through a pulley or pinion mounted on its hub. All other parts mounted on the shaft revolve with it and constitute the continuously running driving member. Except for the collector rings *d*, this has only three parts—two steel castings *e* and *f* and a bobbin between them holding the exciting coil *g*. The two castings form a magnetic circuit broken by the air gap at the circumference in which the copper ring *c* is situated. The castings are cut away at the outside to concentrate the magnetic flux at eight poles, leaving spaces between them through which there are no magnetic lines except the few due to leakage. The copper ring has ample running clearance between the oppositely facing poles.

When current is flowing in the exciting coil and the driving member is revolving, the copper ring is dragged after the driving member by mutual attraction of the magnetic flux and the eddy currents set up in the copper. The action is the same as that in an induction motor except that the revolving field is fixed relative to the driving member and is revolved mechanically by revolving that member.

The clutch is thrown into action by turning current into the exciting coil through brushes which bear on the collector rings. When this circuit is broken the clutch instantly releases. The forces on the copper ring being tangential, the ring has no tendency to be drawn to the poles on either side, and, since there is no friction, there is no wear. The relations between slip and torque are substantially the same as those obtained in an induction motor and variations in these relations can be produced by making the ring thicker or thinner in the web or flanges or both, or by varying the strength of the exciting current. Greater or less exciting current gives greater or less torque for the same slip, and conversely less or greater slip for the same torque. The speed of the driven member may thus be controlled by varying the strength of the exciting current, but unless speed control is wanted it is most economical to throw on the full exciting current because then the clutch transmits a certain torque with the minimum slip.

#### The Clutch Ratings.

It is the practice to rate these clutches at the power which they can transmit at an efficiency of 90 per cent. at a given rate of speed. For example, a clutch rated at 25 hp. at 500 rev. per min. receives that power at that speed on the driving side and delivers 22½ hp. at 450 rev. per min. from the driven side. The loss in the clutch is a speed loss due to slip, but the full torque is transmitted. When only one-half rated torque is called for, the slip will be only about one-half as great, and the efficiency 95 per cent. At more than full load torque the clutch

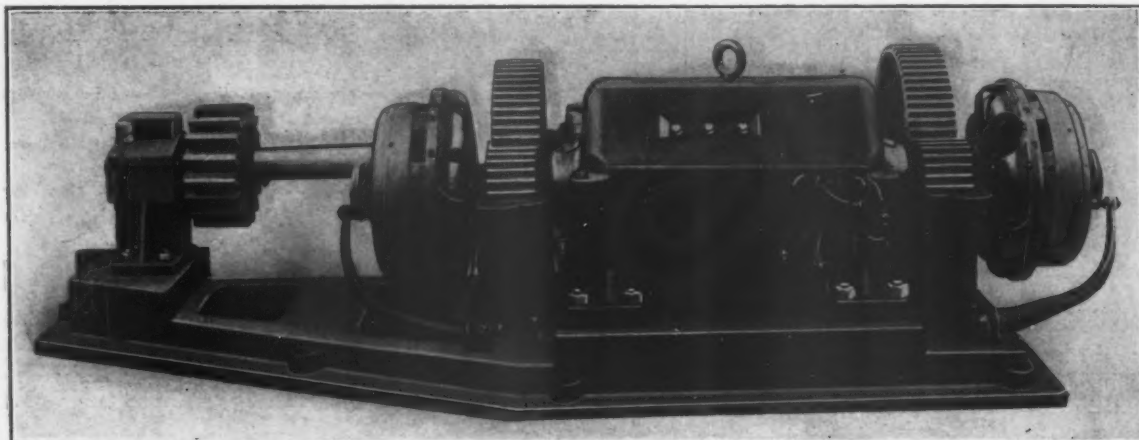


Fig. 4.—A View from the Opposite Side of a 75-Hp. Rolling Mill Reversing Drive.



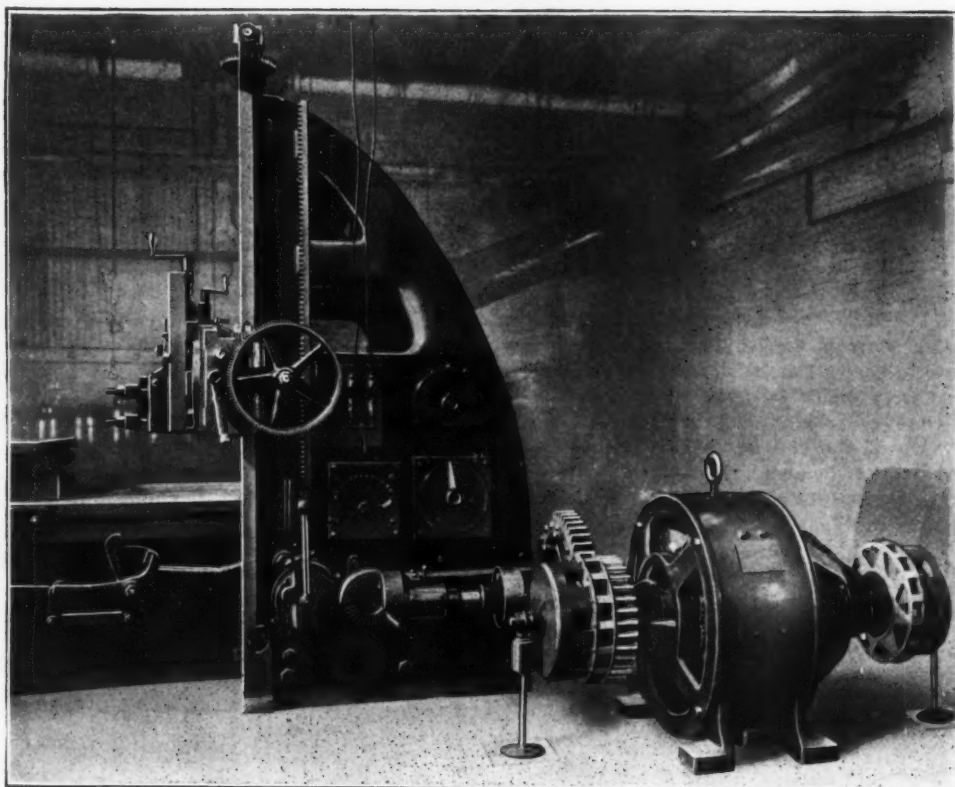


Fig. 5.—A Planer Equipped with the Induction Clutch Reversing Gearing.

loses more than 10 per cent. of the revolutions of the driving member. The limiting torque transmitted is usually fixed at 50 per cent. above full load rated torque; then the driven side of the clutch is stalled, but the driving side continues to revolve without exceeding the 50 per cent. overload on the driving motor, all the power being converted into heat in the copper ring. This heat is dissipated by a blast of air thrown against the ring by the revolving poles which act as fan blades. The ring is so proportioned that it heats uniformly and hence does not buckle even at red heat. Freedom for expansion is allowed by holding the ring at its outside circumference by fastenings which allow radial movement but positively rotate the ring with the spider. At full load the ring is hardly warm.

In rating these clutches the temperature rise is not a limiting factor, as with dynamos and motors, because all parts are designed to stand very high temperatures; the copper ring is indestructible, and the exciting coil is wound with asbestos covered wire. The clutches are therefore rated at the pull which they can exert and it is immaterial whether this pull is momentary or continuous so far as temperature is concerned. The clutches are remarkably small compared with the motors whose power they transmit; a clutch of 90 per cent. efficiency

usually weighs only one-seventh as much as the motor with which it is used.

#### Applications of the Clutch.

From the foregoing it is apparent that the clutch is adapted for use between a continuous running motor and driven machinery which must be very frequently started, stopped, and reversed, and is subject to stalling and careless handling. The full exciting current is about two per cent. of the full motor current, and it is only this that is handled by the operating switch, the motor circuit being undisturbed while the drive is in use.

Fig. 2 shows a drive of 50 hp. capacity as built for operating rolling mill tables. The motor is of the Crocker-Wheeler rolling mill type, all parts being extra heavy, especially the shaft, and the same rugged construction is used in the clutch gearing. The motor is compound wound, having a no-load speed of about 700 rev. per min. and a full load speed of 500 rev. per min. The difference between these speeds gives a good range for utilizing the flywheel energy of the motor armature and the relatively heavy driving members of the clutches. The clutches, two in number for reversing drives, are hung on the extended ends of the motor shaft, which is always heavy enough to allow this simple mounting.

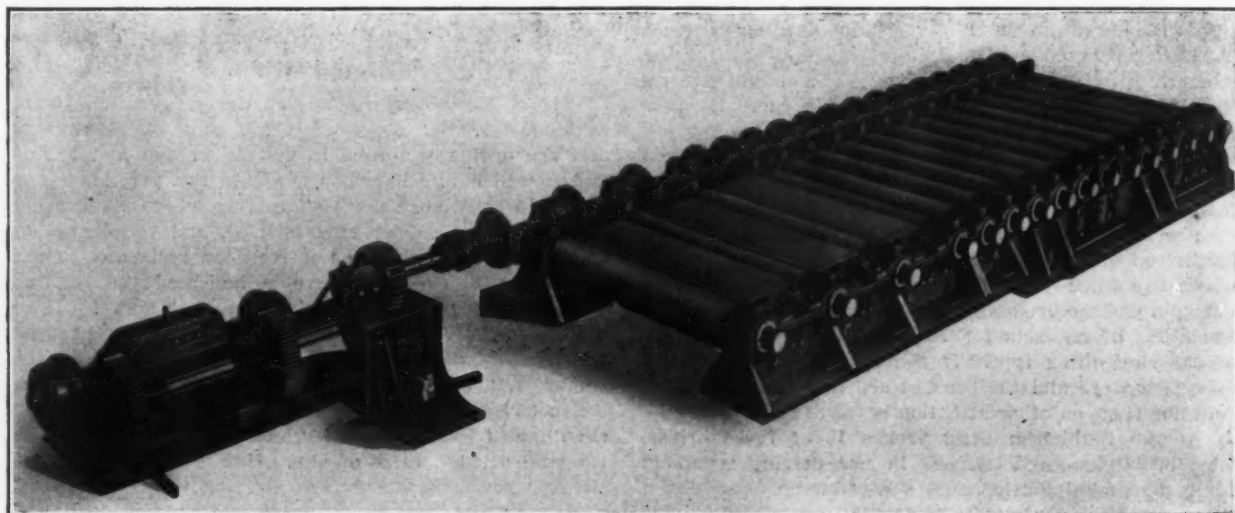


Fig. 6.—Blooming Mill Tables with a 75-Hp. Induction Clutch Drive Such as that Shown in Fig. 4.

The clutch on the right in the front elevation, Fig. 2, carries a gear on its driven member, which meshes a pinion on the motor shaft. The arrangement on the left is the same except that there is an intermediate gear between the driving pinion and gear to give the reverse rotation. The idler turns on a stationary pin held by the heavy gear case, as indicated in the left end elevation. No controller is used except a two-point switch which, for this 50 hp. drive, handles only a 5-amp. clutch exciting current, directing it to either clutch to drive with full power in either direction. Reversing the switch as rapidly and often as possible can do no harm since only 50 per cent. overload can be thrown on the motor even if the back gear shaft is locked, and the clutches are able to dissipate in heat all the power that the motor can deliver to them even under this, the severest condition. As soon as the driven side is unlocked the drive will resume, the action of the clutches being practically the same when red hot as when cold.

On account of the self-induction of the clutch exciting

stalling, but these drives are declared to be very satisfactory. Two of 50 hp. each are in operation at the South Works of the Illinois Steel Company, driving slabbing mill tables, and two of 75 hp. each are installed at the Ensley plant of the Tennessee Coal, Iron & Railroad Company on roughing mill tables. Views of the rolling mill type of drive are shown in Figs. 3 and 4.

Fig. 5 shows the drive as applied to a planer. This drive is in use on several heavy planers, where it seems to be satisfactory on account of its simplicity, smoothness of acceleration, ability to stall without injury, and ease of control. When used as a planer drive reverse is accomplished by the dogs throwing the control switch and a very simple attachment to this switch gives a large range of cutting and return speeds independent of each other by regulating the shunt field current of the motor. Fig. 6 shows a 75 hp. induction drive with motor attached, temporarily, to heavy blooming mill tables in the Wheeling Mold & Foundry Company's shop.

Another manner of assembling clutch gearing is shown

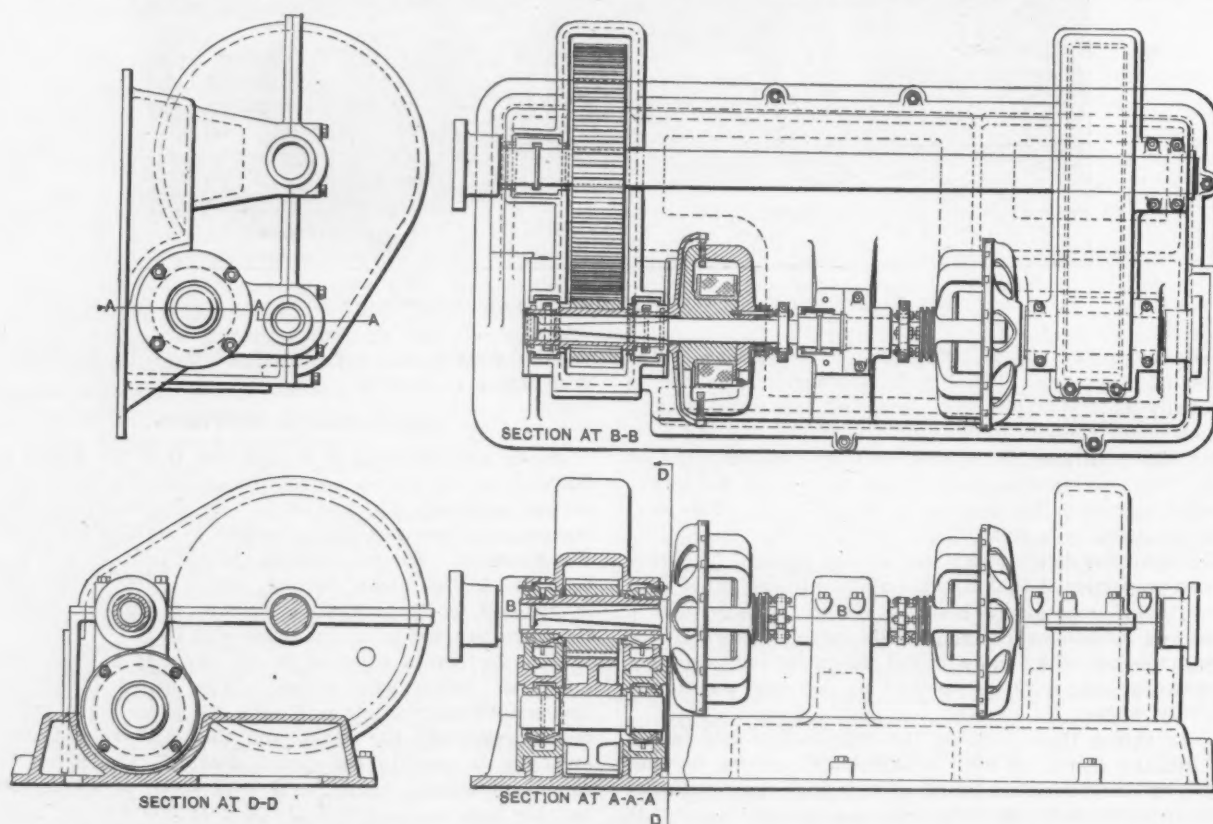


Fig. 7.—Details of a Reversing Drive Built Independent of the Motor and Intended to Be Connected to It at One End.

coil a short but definite time is required for the exciting current to reach full strength after the switch is thrown. This reduces the shock to the gears of the driving and driven machinery and contributes to smoothness of operation. The clutch can be made to respond practically instantaneously to the throw of the control switch by winding the exciting coils with heavier wire and limiting the strength of exciting current by external non-inductive resistance left permanently in the exciting current. This has not been found necessary in any work so far encountered, as sufficiently quick response for all practical requirements is obtained by the use of wire small enough to furnish of itself all the resistance needed.

The idler gear bushing and the loose bearing inside the driven spider are lubricated by oil returning bushings which are filled with oil through central holes in the idler pin and motor shaft while the drive is in operation; one filling of oil lasts for 10 days. Other bearings are of the ring oiling type. If the bearings are given oil every few days and the brushes are in contact with the collector rings no other attention is required.

At the Bethlehem Steel Works 13 of these drives, each of 30 hp. capacity, are in use driving reversing tables and manipulators, and one of 50 hp. operating a beam transfer. Ordinarily hydraulic power would have been used for the manipulators on account of frequent

in Fig. 7. In this arrangement the drives with their gears are at one end of the motor with a central driving shaft connected to the motor by a flange coupling. Each spider sleeve has an outside ring oiling bearing on each side of its pinion, so that the sleeve does not come in contact with the driving shaft.

#### Performance Tests.

Fig. 8 shows performance curves of a clutch 16 in. in diameter, the abscissas being slip in revolutions and the ordinates torque in pounds at one foot radius and corresponding horsepower at 800 rev. per min. The curves in full lines show performance where a relatively high resistance copper ring is used, and the curves in broken lines that where a relatively low resistance copper ring is used. On each curve is indicated the exciting current used throughout points on that curve. Two amperes at 220 volts is the full exciting current used for this 16-in. clutch. It will be observed from the curves that, other things being equal, a ring of greater conductivity gives greater torque at lower rates of slip than one of less conductivity, and that this condition is reversed at high rates of slip. Hence rings of high resistance are used where high starting torque is desired more than high running efficiency under steady load, and low resistance rings are used where high running effi-



ciency is of greater importance than high starting torque. Both high efficiency in steady full load running and high starting torque can always be obtained if desired by using a larger clutch. By using rings of relatively high resistance a very simple slip control is obtainable by varying the exciting current with the rheostat. The curves show why this can be done over a wider range with high than with low resistance rings.

#### Field of Usefulness.

The induction clutch is capable of being applied in numerous connections simply as a clutch to be thrown in and out by closing the exciting circuit. However used, it has the property of positively protecting the driving and driven machinery against overload beyond the capacity of the clutch, which capacity is under control by fixing the strength of the exciting current. In reversing drives its most important field seems to be that of rolling mill tables, metal planers, elevators, mine hoists, and reversing rolling mills, using power from either direct or alternating current continuously running motors. The clutch and drive have been redesigned in most particulars to suit requirements for the last two applications named, and give promise of competing with the Ilgner system in simplicity, first cost, and efficiency.

Exclusive rights to the manufacture and sale of the

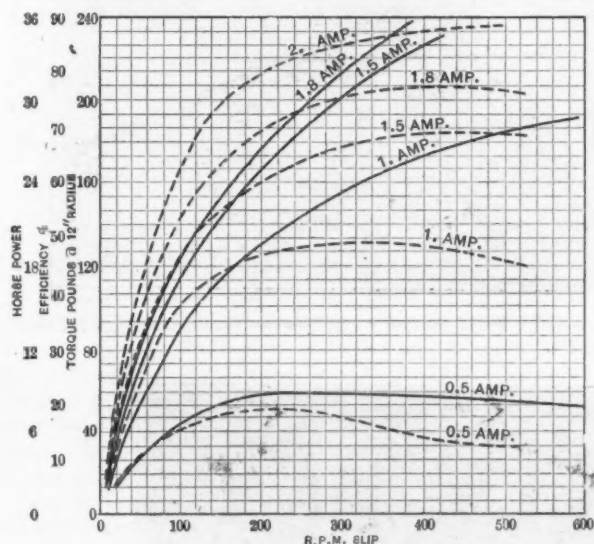


Fig. 8.—Performance Curves of a 16-In. Electric Induction Clutch.

induction clutch in various forms, and of the induction drive, are held by the Wheeling Mold & Foundry Company under patents taken out by A. P. Steckel of Buffalo, N. Y., and F. du P. Thomson of Wheeling, W. Va.

#### Steel Imbedded in Concrete.

The London *Times Engineering Supplement* published the following report by R. T. Glazebrook, director of the National Physical Laboratory, of the result of investigations undertaken at the request of Sir John Brunner:

A strong wooden box was made and divided into five partitions, each partition being 12 in. long,  $7\frac{1}{2}$  in. wide and  $7\frac{1}{2}$  in. deep. Specimens of mild steel of the following dimensions were prepared: 1. One inch diameter, 8 in. long, turned all over. 2. Eight-inch lengths cut from a  $1\frac{1}{2} \times 1\frac{1}{2}$  in. bar with the scale left on. The partitions were half-filled with good Portland cement concrete and a specimen of each kind laid on the top, and the partitions were then filled up. This was done on December 21, 1906. The blocks were covered with water several times a week for a year, and for three months afterward were left in the open subject to the weather. On April 20 one of the blocks was removed from the box and broken up, and the specimen removed. On examining the specimens carefully no trace of any action by the cement could be detected. The turned specimen was practically as bright as when it was put in, and the scale on the rough specimen was undisturbed. To test

the possibility of any slight action the surface of the turned specimen was polished and etched and examined under the microscope side by side with a specimen of the same material cut from the center of the bar. No difference in the micro-structure of the two specimens could be detected, and the conclusion is that in 16 months no action has taken place between the metal and the concrete. It is proposed to immerse one of the remaining blocks in the comparatively warm water of the cooling pond for six months and then to examine the specimen.

#### The Philadelphia Foundrymen's Association.

The one hundred and seventy-eighth regular monthly meeting of the Philadelphia Foundrymen's Association, the last before the summer recess, was held at the Manufacturers' Club on the evening of June 3. President Thomas Devlin was in the chair. The business transacted was largely of a routine nature. The treasurer's report showed a balance of \$2481.31 on hand, with all indebtedness paid.

The secretary read the various circular letters sent out by Dr. Richard Moldenke, secretary of the American Foundrymen's Association, regarding the Toronto convention, and it was noted that a good number of foundrymen from Philadelphia and vicinity had expressed their intention of attending.

A. A. Miller, secretary of the Committee of Representatives of the Consignors, Transportation Companies and Consignees, which held a meeting to consider the question of discrepancies in shipping and outturn weights of pig iron, coal and coke in Philadelphia March 18, presented the final report of that committee. This comprised a publication of 74 printed pages. The statement was made that an understanding had—in a measure—been arrived at with some of the transportation interests and shippers, particularly regarding coke, whereby methods of check weighing might be employed to meet the railroads' requirements to establish losses of material in transit, and also to establish the correctness or incorrectness of the marked tare weight on cars. Transportation interests declared that, to obtain a check weight establishing a loss of coke in transit, it would be necessary for the consignee to use the same methods in weighing at the delivery point as at the shipping point. Cars must be weighed on railroad track scales by representatives of the railroad company and the marked tare used as the light weight of the car. Errors in marked tare may be arrived at by the same method of weighing, after the car had been cleaned out to the satisfaction of the railroad company's representative. A number of the transportation companies expressed a willingness to allow for shortages, if established to their satisfaction by approved methods, and after such allowances had been made by the railroads the shippers (where railroad weights govern the shipment) expressed a willingness to reimburse the consignee for shortages in material delivered.

Fire insurance was the special subject under discussion at this meeting of the association. The subject was presented in an able manner by Louis S. Amonson, president of the People's National Fire Insurance Company, Philadelphia, who treated the question along broad lines rather than from a technical standpoint.

Following the meeting a luncheon was served on the roof garden of the club.

Postmaster-General Meyer announced June 3 that an agreement had been reached with the British Government providing for a letter postage of 2 cents an ounce between the United States and Great Britain and Ireland to become operative October 1, 1908. It is not improbable that in the near future, a reciprocal rate of 2 cents an ounce on letters will be in effect between the United States and Italy, Germany, France and other European countries.

The American Roll & Foundry Company, Canton, Ohio, has just completed a 40-in. slabbing mill for the Ohio Works of the Carnegie Steel Company, Youngstown, Ohio.

### A Carlin Grinding Pan Installation.

In its new open hearth steel plant at Monessen, Pa., the Pittsburgh Steel Company is installing a complete equipment for crushing and grinding clay in preparing the refractory linings for furnaces and ladles. This in-

to a 30 hp. motor running at 1025 rev. per min. and supported from the ceiling. This crusher will reduce the ganister, dolomite, &c., to about two in. size before calcining.

The dry pan is also shown in Fig. 1 and is of the Carlin standard type, 9 ft. in diameter. This will be

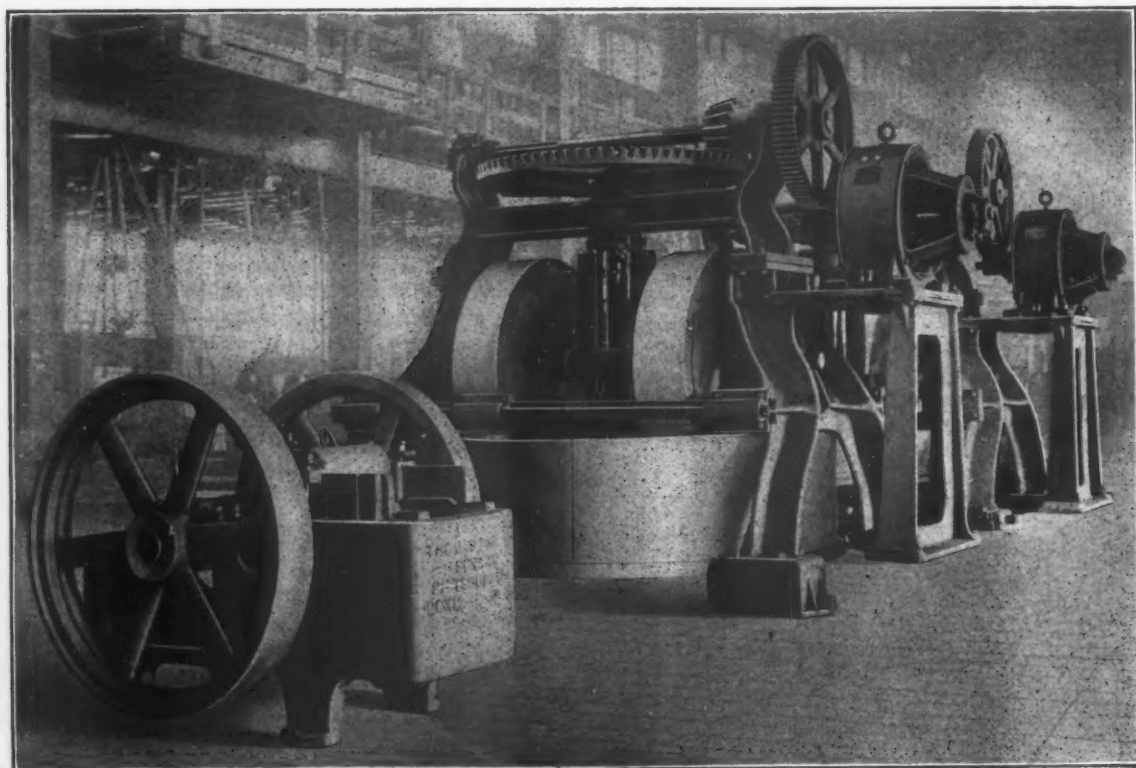


Fig. 1.—The Crushing and Grinding Equipment Furnished the Pittsburgh Steel Company by Thomas Carlin's Sons Company, Pittsburgh, Pa.

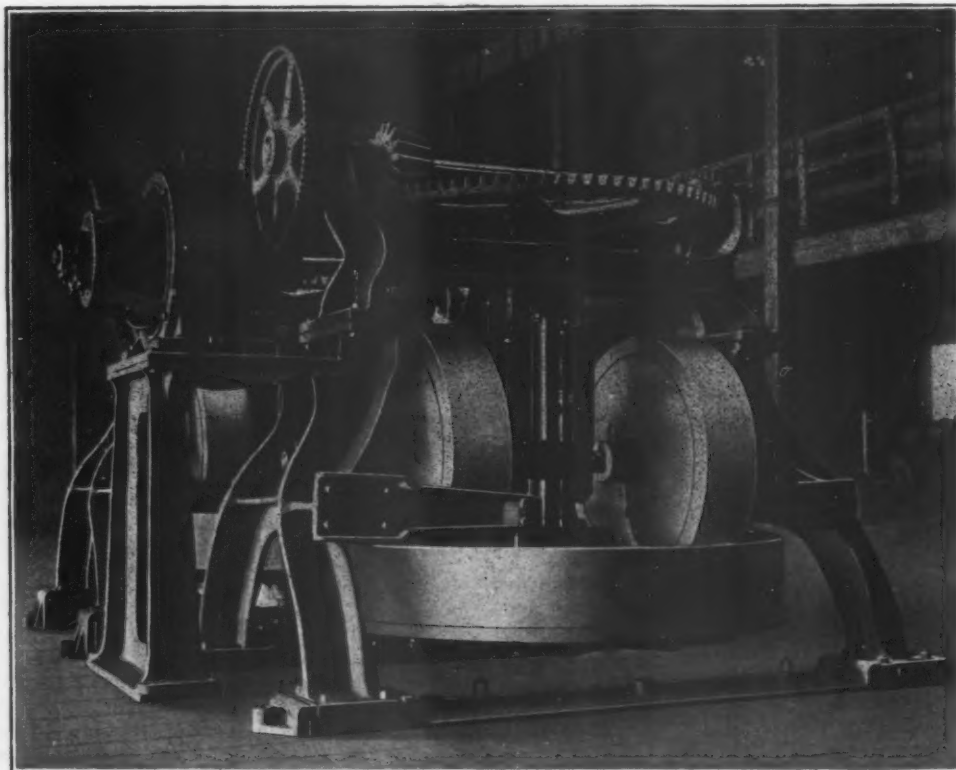


Fig. 2.—The Carlin Standard 8-Ft. Wet Pan Grinder.

cludes a crusher, belt conveyer, dry and wet pans, &c., furnished by Thomas Carlin's Sons Company, 1600 River avenue, North Side, Pittsburgh, Pa., all arranged to be driven by Westinghouse direct current motors.

The view of the machinery given in Fig. 1 shows the crusher in the foreground. This is of the unmounted Blake type with 20 x 12 in. openings, and will be belted

used for grinding clay, lime, &c., in a dry or semi-dry state. The pan proper is a single casting with heavy deep ribs underneath, and a false or removable bottom beneath the tread of the rolls. The perforated plates are bolted to the arms of the pan and have chilled openings insuring uniformity and preventing excessive wear. The pan when running at its proper speed causes the ground



material to slide to the outer edge and over the sifter plates; that sufficiently fine falls into a stationary iron catch pan and that too coarse is thrown under the rolls again by stationary scrapers which can be adjusted. The ground material in the catch pan is drawn by scrapers attached to the arms of the revolving pan to an opening leading to a bucket elevator. The elevator is operated by a 5-hp. motor and a series of bins are provided for storing the different materials. The dry pan is directly connected to a 40-hp. direct current motor mounted on an extended casting. This outfit weighs 52,000 lb.

The wet pan is shown in Fig. 2 and is of the Carlin standard type, 8 ft. in diameter. This machine is provided with a rigid iron housing, and is fitted with patent rolls, the shafts of which are supported at either end by coil springs, tool steel toe and hard bronze plate heavy

pecially adapted to locomotive work and is said to be the only machine of the kind regularly manufactured for this specific purpose.

Both in its construction and operation the machine is exceedingly simple. As may be seen in Fig. 1, it is composed of an abrasive wheel mounted on the extension of an air motor shaft, the whole being supported on a frame consisting of two parallel guide rods with housings set on cross travel rails. Being light and portable the machine is set over the valve seat of a locomotive steam chest as shown in Fig. 2, and is bolted thereto with studs or cap screws extending through the slots in the guide rails.

The cutting and travel feeds are under hand control. The former is regulated by the feed screw above the machine which raises and lowers the wheel and the cross

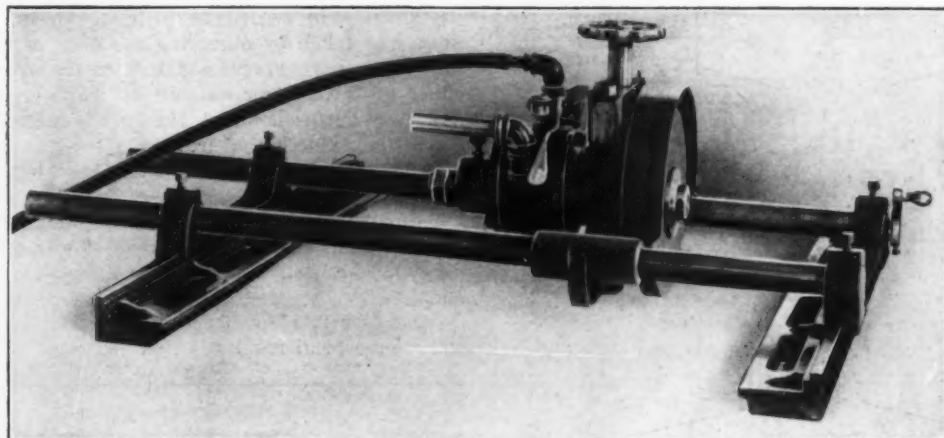


Fig. 1.—The Monarch Valve Seat Grinder Sold by the Quincy Enameling & Foundry Company, Quincy, Ill.

gearing, &c. The pan bottom has deep, heavy arms to support the weight of the unusually heavy rolls, with a large bearing on the vertical shaft and its collar. Its rim is removable. The false bottom plates are made of a special mixture of iron and are secured in place with taper head bolts in the path of the rolls. This pan is directly driven by a 40-hp. motor, and the total outfit weighs 44,500 lb.

The plant is complete in every respect and will enable the Pittsburgh Steel Company to prepare its refractory lining material to advantage at its own plant.

### The Monarch Valve Seat Grinder.

Although intended primarily for grinding the seats of locomotive slide valves, the Monarch valve seat grinder, invented by J. A. Chadwick, Moberly, Mo., and made by the Quincy Enameling & Foundry Company, Quincy, Ill., is not strictly limited to this service. It is, however, es-

pecially adapted to locomotive work and is said to be the only machine of the kind regularly manufactured for this specific purpose. Both in its construction and operation the machine is exceedingly simple. As may be seen in Fig. 1, it is composed of an abrasive wheel mounted on the extension of an air motor shaft, the whole being supported on a frame consisting of two parallel guide rods with housings set on cross travel rails. Being light and portable the machine is set over the valve seat of a locomotive steam chest as shown in Fig. 2, and is bolted thereto with studs or cap screws extending through the slots in the guide rails.

The cutting and travel feeds are under hand control. The former is regulated by the feed screw above the machine which raises and lowers the wheel and the cross

### A Frevert Souvenir.

An interesting little puzzle is being distributed by the Frevert Machinery Company, 18 Dey street, New York City. It consists of two small metal pieces fitted together with what appear to be opposing dovetails, so that at first glance it looks to be impossible to separate the parts, the dovetails being undercut in the two directions that evidently are the only ones in which the parts could slide apart. While the joint is perplexing to the average person, most carpenters would recognize it as what is known as a dovetail halved joint with two bevels, although it is very seldom used in practice. As a matter of fact it is not what it appears to be—a double dovetail, but a single dovetail inserted endwise on a slight angle so that at the abutting end the groove is deeper than at the outer end, consequently the exposed side appears deceptively to be another dovetail. The parts are simply held together by friction, and what is perhaps most interesting is the fact that the parts were cast to fit and not machined.

The report of H. S. Pell, receiver of the Niles Boiler Works, Niles, Ohio, has been filed. The total amount of claims filed is \$111,276.66. The receiver recommends the allowance of \$109,969.21 on these claims.

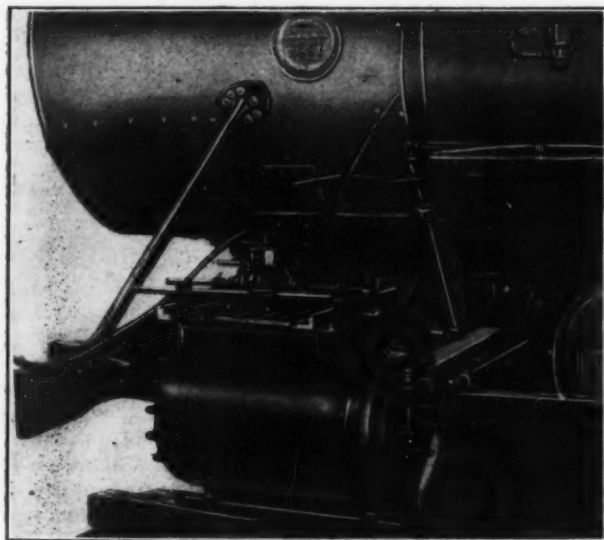


Fig. 2.—The Machine in Use Grinding the Seat of a Locomotive Slide Valve.

## Examination of a 100-lb. Rail.

BY G. B. WATERHOUSE, PH. D.

(With Supplement.)

The strength, composition and structure of the material in different parts of rail have always been somewhat unsettled points. The work described in this article bears directly on these questions, and serves as a contribution to our knowledge of rails and rail steel.

In order to obtain material for the tests, a first quality rail was taken from stock—weight 100 lb. to the yard and section advocated by the American Society of Civil Engi-

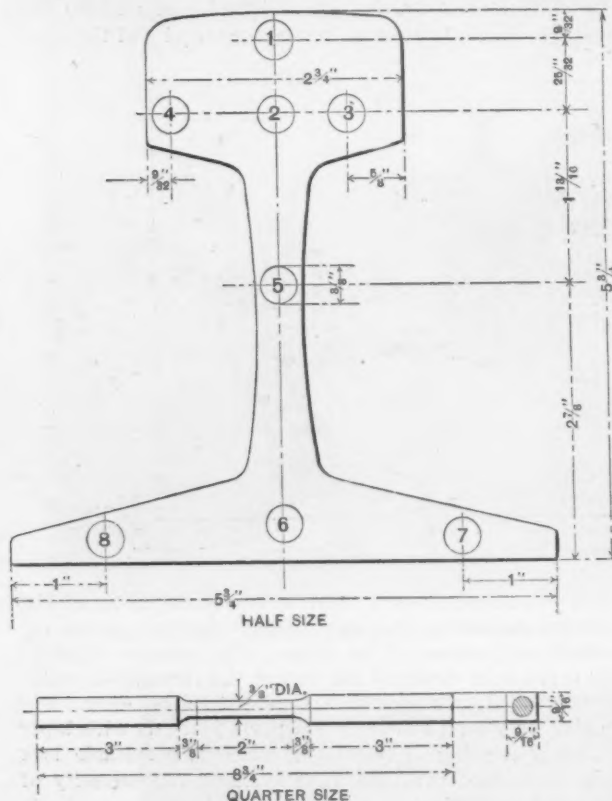


Fig. 1.—Position, Numbers and Dimensions of Test Pieces in the Examination of a 100-Lb. A. S. C. E. Rail.

neers; in other words, a 100-lb. A. S. C. E. rail. The steel was made by the acid Bessemer process and the ingots were rolled without reheating.

From this rail two adjacent pieces 8 $\frac{1}{4}$  in. long were cut with a slow speed cold saw, and from these pieces tensile tests were machined of the dimensions and in the positions shown in the drawing, Fig. 1. The results of the tensile tests are given in the following table, the figures being the average of those obtained from the duplicate pieces:

Table 1.—Tensile Tests.

No.	Elastic limit.	Ultimate stress.	Elongation.	Reduction
			Per cent. in 2 in.	of area. Per cent.
1.....	52,200	108,400	16.75	29.9
2.....	52,200	109,850	16.25	28.4
3.....	54,460	110,750	18.50	33.2
4.....	55,000	110,150	18.50	28.6
5.....	53,100	110,300	18.25	29.4
6.....	53,820	110,400	18.00	31.0
7.....	51,740	109,850	18.25	35.4
8.....	53,340	111,800	17.00	36.4

Drillings were taken from the ends of the test pieces, which gave the following results on analysis, the figures having been averaged as before:

Table 2.—Analysis.

No.	Car.	Sil.	Man.	Sul.	Phos.	Copper.
1.....	0.52	0.140	0.77	0.074	0.089	0.185 average.
2.....	0.51	0.145	0.77	0.076	0.089	
3.....	0.52	0.152	0.77	0.079	0.090	
4.....	0.52	0.144	0.77	0.078	0.090	
5.....	0.52	0.150	0.78	0.077	0.090	
6.....	0.50	0.146	0.76	0.080	0.089	
7.....	0.53	0.153	0.77	0.080	0.090	
8.....	0.52	0.147	0.77	0.080	0.090	

Pieces were also cut from the ends of the test pieces and prepared for microscopical examination. Photo-

graphs were taken at a magnification of 70 diameters, as nearly the center of the positions shown in the sketch as possible. These are reproduced in the accompanying plate. The transverse sections are those looking at the end of the rail, while the longitudinal are those looking from the side. They correspond, therefore, with a front and side elevation.

### Consideration of Results.

The average composition of the rail is:

	Per cent.		Per cent.
Carbon .....	0.51	Sulphur .....	0.078
Silicon .....	0.147	Phosphorus .....	0.089
Manganese .....	0.77	Copper .....	0.185

The analyses from the different positions show that the steel is very uniform, none of the figures departing greatly from the average. The physical tests also show the steel to be very uniform in its mechanical properties, particularly in regard to ultimate stress. The elastic limit was taken by observing the drop of the beam and the other measurements obtained in the usual way. The effect of the greater amount of work on the web and flanges is not pronounced, the only notable difference being in the reduction of area.

The microphotographs of Nos. 1 to 6 indicate that the finishing temperature was also of considerable uniformity, for the transverse sections are very similar in pattern and in size of crystals. The much lower temperature of the flanges is well illustrated by the photographs of Nos. 7 and 8.

The correlated evidence of the chemical, mechanical and microscopical results is that the steel is of very good

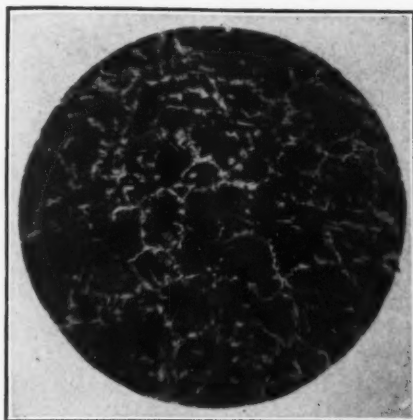


Fig. 2.—Photographic Reproduction, Half Size, of a Polished Section of a 100-Lb. Rail, Etched in Hydrochloric Acid, 1 to 1, for 20 Hr.

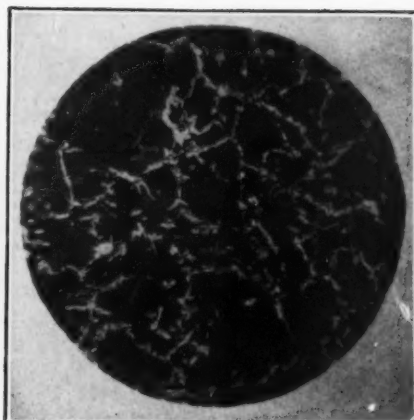
and even quality, which is also supported by the print given in Fig. 2 of a polished section of the rail, etched in hydrochloric acid, 1 to 1, for 20 hr.

The Iron City Coal & Coke Co., Pittsburgh, Pa., has purchased three-fourths of the capital stock of the Peerless Connellsville Coke Company. The latter company is capitalized at \$40,000, and owns and controls approximately 50 acres of the 9 ft. Connellsville vein of coal. This includes adjoining coal to its property, part of which is under an option, and the balance can be secured when needed. The plant is located at Alverton, Pa., on the southwest branch of the Pennsylvania Railroad near Scottdale, includes 32 ovens at present, and is a fully equipped modern coke plant. The Frick Coke Company has three large plants at this point, and the Rainey interest has one. G. W. Wilson, vice-president of the Iron City Coal & Coke Company, has been elected president of the Peerless Connellsville Coke Company. The plant is now in full operation, and the coke is sold ahead on contracts for 60 days.

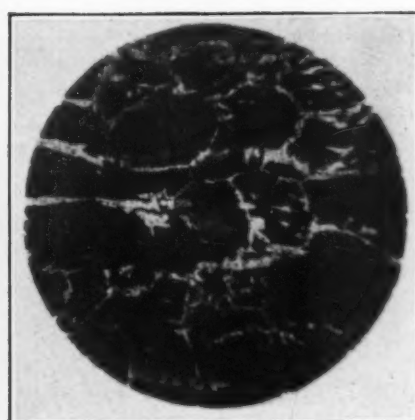




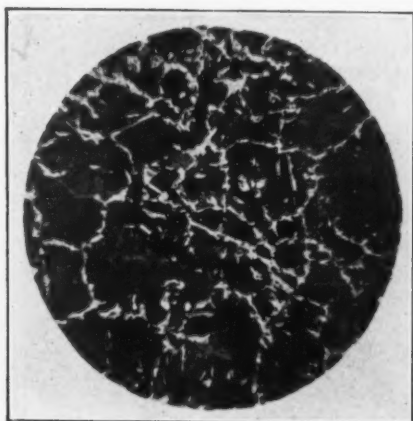
No. 1.—Transverse



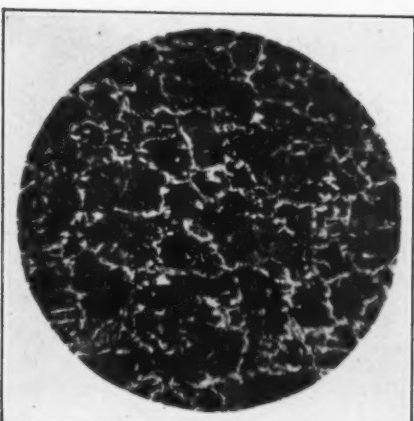
No. 2.—Transverse



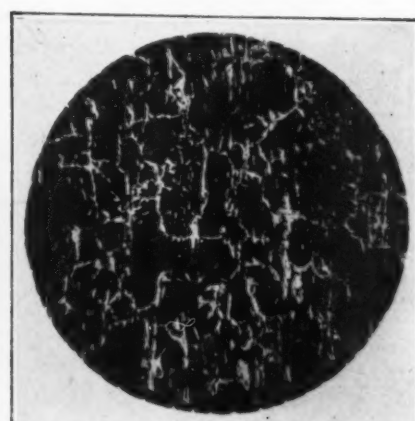
No. 2.—Longitudinal



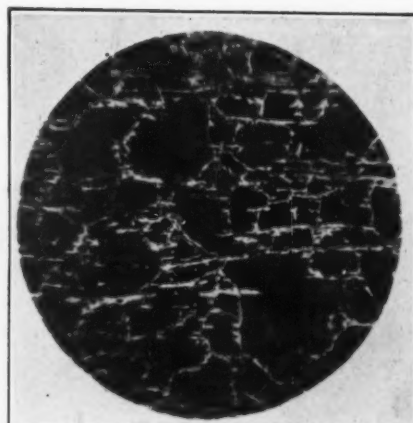
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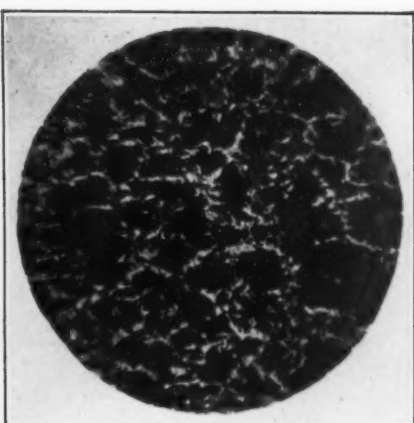
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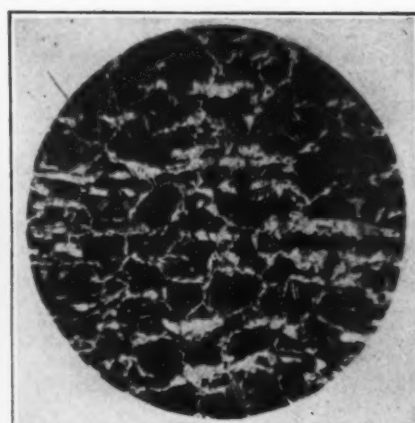
No. 5.—Transverse



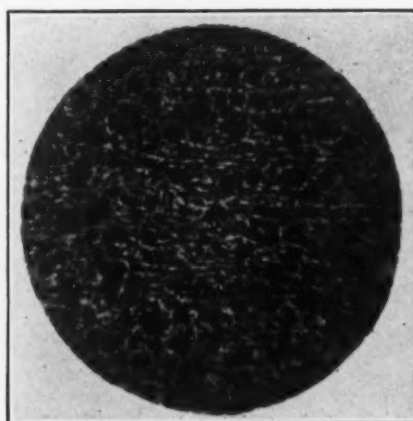
No. 5.—Longitudinal



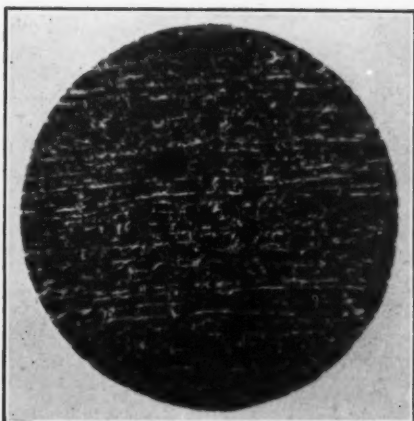
No. 6.—Transverse



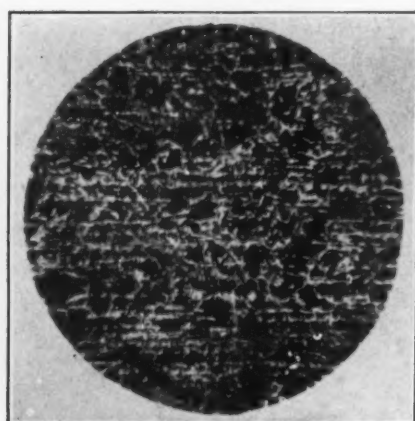
No. 6.—Longitudinal



No. 7.—Transverse



No. 7.—Longitudinal



No. 8.—Longitudinal

Microphotographs of Portions of the Rail, Magnified 70 Diameters. Etched in Diluted Nitric Acid

### EXAMINATION OF A 100-LB. RAIL





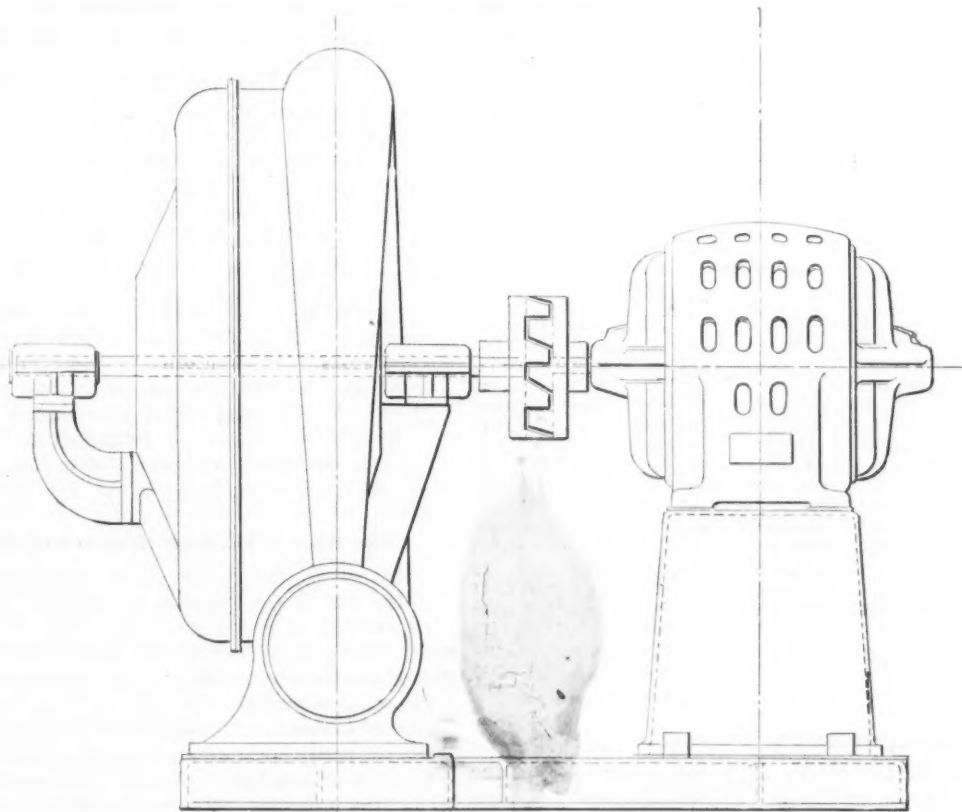
### Buffalo Compound Pressure Blowers.

Since the pressure at which air is delivered by a centrifugal fan is determined by the peripheral speed of the blast wheel, fans of large size generally cannot be driven by direct connection to electric motors because the speed of the latter is limited. Where a pressure of over 6 or 8 oz. is required it is necessary to drive the ordinary blower with a belt. Such outfits require more floor space, more attention to bearings and are also less efficient than the direct connected sets.

The Buffalo Forge Company, Buffalo, N. Y., builds a compound blower which will deliver the air at double the pressure of the simple fan with the same diameter blast wheel when run at the same speed. This permits blowers of practical and efficient proportions to be directly connected to large motors of 50 to 75 hp. The blast wheels are mounted on a single shaft and incased in a cast iron housing, built up in transverse sections, permitting the interior parts to be easily inspected or removed. These

ing is located in the pressure chamber between the two stages.

A number of these fans of the larger sizes have been installed by the Lehigh Valley Railroad; Fanner Mfg. Company; Strong, Carlisle & Hammond Company, and the Indiana Steel Company of Gary, Ind. Two are now being constructed for the latter to supply blast to the cupolas at a pressure of 16 oz. per square inch. Each fan will deliver a maximum of 9500 cu. ft. of air per minute at this pressure when running at 1420 rev. per min., and will be driven by a 75-hp. General Electric form K three-phase 440-volt 25-cycle induction motor. Each blower with its motor is mounted on a cast bed plate, occupying a floor space of 7 x 5 ft., and the height is about 7 ft., or the same as a simple blower of this capacity delivering the air at one-half the pressure. Connection between each blower and motor is made with a flexible coupling designed by the Buffalo Forge Company, which, in addition to being flexible, acts as an insulator between the motor and the blower; there is no metal contact, the torque being trans-



Front Elevation of the Buffalo Compound Pressure Blower Direct Connected to an Electric Motor.

wheels are of a special design, the arms being secured to the hub tangentially instead of radially, the usual practice. This eliminates the necessity of bending the T irons through a large angle, which, in addition to weakening the wheel, offers more resistance to the flow of air.

One inlet is on the side opposite the motor and, being unobstructed, can be made of smaller diameter. The advantage of this is that the air entering the fan does not strike a part of the blade, which is moving at a high velocity, until the direction of the air has changed and the air itself has attained a high velocity. The curvature of the blade is such that the velocity of the air is gradually increased as it approaches the tip, at which point the velocity of the air is slightly above that of the blade. The air from the first stage is discharged into a pressure chamber around the entire circumference of the wheel, and at a pressure approximately half the total pressure at which the air is discharged. The air next enters the second stage, in which the blast wheel is the same as in the first. The scroll in this stage is involute in form and so designed as to increase the area in the casing directly as the increase in volume of air discharged from the blast wheel throughout a single revolution. Substantial oil ring bearings are provided, one on each side of the housing, as shown in the illustration herewith, and when the width of the blower is sufficient to require such, another bear-

mitted through solid rubber cylinders imbedded in machined grooves in each half of the coupling.

The Buffalo Forge Company makes these blowers in all sizes up to capacities of 12,000 cu. ft. of air per minute, at any pressure up to 24 oz. per square inch.

**An Arkansas Valley Improvement Project.**—A recent convention held in La Junta, Colo., and attended by over 400 delegates representing the business interests of the Arkansas Valley, including the 27 towns located in that territory, was called to formulate plans for the carrying out of an extensive power, irrigation and transportation enterprise. Construction of the proposed systems involves a cost roundly estimated at about \$15,000,000, and embraces the building of a large dam for irrigation and power purposes, the installation of a hydro-electric plant and the building of about 350 miles of electric railroad through the Arkansas Valley. A committee on organization composed of prominent financial men from the districts interested was selected, and at a subsequent meeting prepared the application for incorporation. Among those named as prominently connected with this movement are Gov. Alva Adams, Pueblo, Colo.; F. D. Pastorius, Colorado Springs, Colo.; J. A. Lockhart, Rocky Ford, Colo.; Robert Patterson and A. B. Hullt, La Junta, Colo.

## The Brown Iron Ores of Alabama.—II.

BY WILLIAM B. PHILLIPS.

Having in the first article of this series briefly sketched the geological horizons in which brown ores may be found, we now propose to discuss the mode of their occurrence, methods of mining, washing and concentration and the use of this variety of iron ore in the blast furnace. In so far as concerns the geological relations of these ores and their occurrence in the State, acknowledgments are freely made to the publications of the Alabama Geological Survey, especially the two volumes by the late Henry McCalley entitled "The Valley Regions of Alabama," published in 1896. In these reports Mr. McCalley collected a vast fund of data concerning the occurrence of brown ores in Alabama, and the reader is referred to them for more specific information.

Before taking up methods of mining, washing, &c., it might be well to devote this article to certain general features of the brown ore industry. The table below gives the production of hematite (red ore), limonite (brown ore) and pig iron in Alabama for the 17 years ending with 1906. There is also a column giving the proportional production of brown ore. Some of the brown ore used in Alabama has come from Georgia and Tennessee, but the total amounts are not of great moment, so far as concerns the purpose of the table:

*Production of Iron Ore and Pig Iron in Alabama, Gross Tons, 1890-1906.*

Year.	Hematite (Red ore).	Limonite (Brown ore).	Per cent.		
			Total ore.	of brown ore.	Pig iron.
1890.....	1,538,297	359,518	1,897,815	18.9	816,911
1891.....	1,524,783	462,047	1,986,830	23.3	795,672
1892.....	1,657,028	655,043	2,312,071	28.3	915,296
1893.....	1,281,292	461,118	1,742,410	26.5	726,888
1894.....	1,182,362	310,724	1,493,086	20.8	592,392
1895.....	1,830,987	368,403	2,199,390	16.7	854,667
1896.....	1,694,948	346,845	2,041,793	16.9	922,170
1897.....	1,738,583	360,038	2,098,621	17.1	947,831
1898.....	1,852,111	548,637	2,401,748	22.9	1,033,676
1899.....	1,911,097	751,846	2,662,943	28.2	1,083,905
1900.....	1,989,689	769,558	2,759,247	27.9	1,184,337
1901.....	2,070,422	731,310	2,801,732	26.1	1,225,212
1902.....	2,565,635	1,008,839	3,574,474	28.2	1,472,211
1903.....	2,779,691	905,260	3,684,951	24.6	1,561,398
1904.....	2,894,423	787,514	3,681,937	21.4	1,453,573
1905.....	2,974,413	781,561	3,755,974	20.9	1,604,062
1906.....	3,173,797	821,301	3,995,098	20.6	1,674,848
Total tons and average per cent. ....			34,660,558	10,429,562	45,090,120
				23.1	18,865,049

An examination of the table will show that in the last 17 years the production of hematite ore has been 34,660,558 tons, with a maximum production of 3,173,797 tons in 1906. The production of limonite or brown ore in this period was 10,429,562 tons, with a maximum of 1,008,839 tons in 1902. The total production of hematite and limonite in the 17 years was 45,090,120 tons, and of this total the production of brown ore was 23.1 per cent. on the average. The largest proportional production of brown ore was 28.3 per cent. in 1892, and the smallest was 16.7 per cent. in 1896.

The production of the so-called gray ores from the Sylacauga District, formerly classed as magnetite, but now as hematite, while encouraging from the standpoint of a future supply of ore, does not affect the general results.

### Red Ore and Brown Ore Production.

In the 17 years under consideration the production of brown ore has been about one-third of the production of red ore and over one-fifth of the entire production of ore. Some of the brown ore mined in Alabama goes to furnaces outside of the State, but this is counterbalanced by the ore brought in from other States. We may, therefore, take the figures given in the table as representing, with a reasonable degree of accuracy, the situation of the brown ore industry with respect to the production of nearly 19,000,000 tons of pig iron.

The use of brown ore in the Alabama furnaces has varied from 16.7 per cent. in 1895 to 28.3 per cent. in 1892, the general average being 23.1 per cent. In other

words, for each 1000 tons of red ore used there have been used 332 tons of brown ore in the production of 18,865,049 tons of pig iron. This statement does not represent the proportional production of pig iron from these ores, for the reason that the brown ore carries more metallic iron than the red ore; and this excess has been. It is thought, an average of five points in the period named in comparison with the soft (lime-free) red ore and 10 points in comparison with the hard (limy) red ore.

The table shows that for the 17 years there were required for a ton of pig iron an average of 2.39 tons of ore, the average content of metallic iron in the ore being 41.84 per cent., which is very close to the average content of iron in the soft ore of the Birmingham district. The average content of iron in a fair brown ore may be taken at 47 per cent. On this basis the 10,429,562 tons of brown ore mined in Alabama in the period named would represent 4,896,481 tons of pig iron, leaving 13,968,568 tons to be derived from the hematite (red ore, both lime-free and lime-bearing). In other words, practically 26 per cent. of the production of iron during the 17 years, ending with 1906, was due to brown ore and 74 per cent. to red ore.

### Virginia a Brown Ore State.

It is interesting to compare Virginia and Alabama in this connection. In the 17 years ending with 1906 the production of red ore in Virginia (and West Virginia) was 455,041 tons and of brown ore 12,269,542 tons. Virginia has been the largest producer and user of brown ore, exceeding Alabama in this period by 1,739,980 tons. For the 17 years the production of pig iron in Virginia was 6,616,459 tons, nearly all of it from brown ore. It is not likely that more than 200,000 tons of pig iron have been produced in Virginia from red ore in the years under consideration, leaving 6,416,459 tons to be derived from brown ore, or 1,519,978 tons more than was produced in Alabama in the same period from similar ore.

Incidentally it may be remarked that the quality of the Virginia brown ore is superior to that of the Alabama ore, this difference being about five points in metallic iron.

### The Rate of Increase in Red and Brown Ores.

Do the statistics given in the table indicate a tendency on the part of the Alabama furnacemen to use increasing proportions of brown ore? It cannot be said that they do. The general average for the period was exceeded in only seven years, and then the excess was not notable. The statistics indicate clearly that from one-fourth to one-fifth of brown ore is used and that this proportion maintains a fairly constant figure. Are there any indications that the use of brown ore will increase in Alabama and that the next few years will show a decidedly different state of affairs? Upon the answer to these questions depends the future of brown ore mining in Alabama and the utilization of the extensive deposits of brown ore that are to be found here.

What encouragement is to be held out to those who propose to acquire brown ore lands either for investment or for practical operations? What is the next period of, say, five years, to show in the direction of ore production and consumption? A closer study of the table may throw some light on this very important question. In 1890 the production of red ore was 1,538,297 tons. In 1906 it was 3,173,797 tons, an increase of 1,635,500 tons; so that we now mine a little over 2 tons for each ton mined in 1890. In 1890 the production of brown ore was 359,518 tons and in 1906 821,301 tons, an increase of 461,783 tons; or we now mine 2.28 tons for each ton mined in 1890. The proportional increase in the production of brown ore is a little in excess of the proportional increase in the production of red ore.

Perhaps it is not exactly fair to go back as far as 1890, because the iron industry was then, so to speak, feeling its way along. It was not until 1898 that the production of pig iron reached the million ton mark and not until 1905 did it exceed the million and a half ton mark. In 1894 there were in Alabama 38 completed stacks and of these only four were of a height of 80 ft. Ten years later, in 1904, there were 43 completed stacks, and 15 of these had a height of 80 ft. The period immediately



preceding 1904 was characterized by the erection of larger furnaces, whether new ones or old ones remodeled. In spite of the fact that for each of the four years preceding 1902 the production of pig iron was in excess of 1,000,000 tons, it is thought that Alabama caught her stride about the year 1902, when it became apparent that larger furnaces were demanded.

#### Future Production Computed on Percentage Increase.

But the larger furnaces and the more active demand for ore to supply them have not brought about a larger relative consumption of brown ore. It maintains its normal ratio of between one-fourth and one-fifth. For the 10 years 1897-1906 the production of pig iron was 13,241,053 tons, as against 6,993,349 tons in the ten years immediately preceding, 1887-1896. Of the 13,241,053 tons produced between 1897 and 1906, 7,766,102 tons, or more than 51 per cent., has been produced in the five years ending with 1906. In other words, in the twenty years ending with 1906 the production of pig iron in Alabama was 20,234,402 tons, and of this amount 7,766,102 tons, or more than 38 per cent., has been produced in the five years ending with 1906. This is an increase of 7.6 per cent. a year. If this ratio of increase is kept up we may expect a production of 2,316,290 tons in 1911. If it is (and "if" is a word of large import) we may expect an ore production of 5,500,000 tons in 1911, provided the quality of the ore remains the same. On this assumption there will be an increase in ore production of 1,530,835 tons, or 306,167 tons a year for five years. Under the conditions which have obtained in Alabama in the 17 years we have been considering, the amount of brown ore mined each year for the next five years should be as follows:

	Tons.
1907.....	892,719
1908.....	964,137
1909.....	1,035,555
1910.....	1,106,973
1911.....	1,178,391

For the five years..... 5,177,775

This is the business which brown ore miners may reasonably expect, it is thought, provided there is no serious backset to the iron industry. How much more they can expect depends upon the quality of the ore and the regularity with which it can be supplied.

#### Increased Use Contingent on Improved Quality.

A careful survey of the entire field of ironmaking in Alabama leads to the conclusion that a great deal more brown ore would be used if it were of a better quality and if regular shipments could be made. In the present depressed condition of the trade it is thought that considerable contracts for brown ore could be made if the quality could be guaranteed to be not less than 50 per cent. of metallic iron and not above 0.50 per cent. of phosphorus.

The production of brown ore last year was less than the amount indicated by the above figures and will be less this year. But the business offering during the period 1907-1911 will depend, on the whole, upon the quality of the ore. There is a wide field in Alabama for the mining of brown ore, provided there is a considerable improvement in the quality.

The articles to follow will indicate, it is hoped, how this may be done profitably.

The United States Court of Appeals, sitting at Boston, has handed down its decision in the patent suit of the Hendey Machine Company, Torrington, Conn., against the Prentice Bros. Company, Worcester, Mass., alleging infringement of the patent covering the so-called quick change feed device. The court finds for the defendant, setting forth in the decision that there is no infringement.

The Morgan Construction Company, Worcester, Mass., is completing the installation of a double strand Morgan continuous rod mill for the Société Anonyme d'Ougrée-Marihay, Ougrée, Belgium. This mill is a duplicate of the Morgan mill now operated by Aciéries & Laminoirs de la Plaine, St. Denis, in Paris, except that it has been arranged to roll 400-lb. coils.

## The Mechanical Engineers' Spring Meeting.

Following is the programme of the spring meeting of the American Society of Mechanical Engineers, to be held at Detroit, Mich., June 23 to 26:

### Opening Session.

Tuesday evening, June 23, at 9 o'clock, in the Convention Hall of the Hotel Cadillac.

Address of welcome.

Response by M. L. Holman, president of the society.

A social reunion and informal reception will be held after the addresses, which will give an opportunity for members and guests to meet and exchange greetings.

### Second Session.

Wednesday morning, June 24, at 9.30 o'clock.

Business meeting. Report of the tellers on election of members and reports of standing and special committees. New business may be presented at this session.

SYMPOSIUM ON MACHINERY FOR HOISTING AND CONVEYING MATERIALS.

"Hoisting and Conveying Machinery," by G. E. Titcomb.

"Continuous Conveying of Materials," by S. B. Peck.

"The Belt Conveyor," by C. Kemble Baldwin.

"Conveying Machinery in a Cement Plant," by C. J. Tomlinson.

"Belt Conveyors," by E. J. Haddock.

### Third Session.

Wednesday afternoon, at 2 o'clock.

Conveying Materials, discussion continued.

"Thermal Properties of Superheated Steam," by Prof. R. C. H. Heck.

"A Rational Method of Checking Conical Pistons for Stress," by Prof. G. H. Shepard.

"A Journal Friction Measuring Machine," by Henry Hess.

### Lecture.

Wednesday evening, at 8.30 o'clock.

"Contributions of Photography to Our Knowledge of Stellar Evolution," by Prof. John A. Brashear, astronomer and scientist, Allegheny, Pa.

### Excursion.

Thursday morning, June 25, at 10 o'clock.

Through the courtesy of A. C. Pessano, member of the Detroit local committee and president and general manager of the Great Lakes Engineering Works, the society will be entertained by a steamer trip to the shipyard of the Great Lakes Engineering Works at Ecorse to witness the launching of the 10,500-ton steamer, the William B. Meacham, and to see the sinking into place of the fourth section of the Detroit tunnel.

### Fourth Session.

Thursday afternoon, June 25, at 2.30 o'clock.

"Surge Tanks in Water Power Plants," by Raymond D. Johnson.

"Some Pitot Tube Studies," by Prof. W. B. Gregory and Prof. E. W. Schoder.

"Comparison of Screw Thread Standards," by Amasa Trowbridge.

"Identification of Power House Piping by Colors," by Wm. H. Bryan.

### Gas Power Section.

Thursday afternoon, June 25, at 2.30 o'clock, simultaneous with the fourth regular session.

"The By-Product Coke Oven," by W. H. Blauvelt.

"Power Plant Operation on Producer Gas," by G. M. S. Tait.

"Horsepower, Friction Losses and Efficiencies of Gas and Oil Engines," by Prof. Lionel S. Marks.

"A Simple Method of Cleaning the Conduits," by W. D. Mount.

### Reception.

Thursday evening, at 9 o'clock, the reception will be held at the Hotel Cadillac. This is the distinctively social feature of the meeting.

### Fifth Session.

Friday morning, June 26, at 9.30 o'clock.

"Economy Tests of High-Speed Engines," by F. W. Dean and A. C. Wood.

"Air Leakage in Steam Condensers," by Thos. C. McBride.

"Clutches," by Henry Souther. Discussion continued from the May meeting.

### Excursion.

Friday afternoon, at 3 o'clock, the members, guests and ladies are invited by the local committee to an afternoon and evening sail on the Detroit River. The steamer Britannia will leave the Detroit, Belle Isle and Windsor Ferry dock, at the foot of Woodward avenue, sail around Belle Isle, thence down the river to Amherstburg and to the head of Lake Erie, returning to the Bois Blanc Island, where supper will be served, and afterward returning to Detroit.

The Colorado Fuel & Iron Company announces that June 1 its branch office was removed from Oakland, Cal., to rooms 614-615 Balboa Building, Second and Market streets, San Francisco.

## The Wallis Chain Grate.

Efforts to secure more perfect combustion and consequent economical and smokeless use of fuel in steam generating plants, have been successful largely through the introduction of mechanical devices, important among which is the traveling chain grate. Of the several efficient types now on the market the Wallis chain grate, designed and manufactured by the Wallis Stoker & Mfg. Company, Terre Haute, Ind., is one of the latest offered. Though not differing in principle from prevailing types, it embodies certain features of improvement which are designed to contribute to its durability, efficiency and economical service. One of these, which forms a de-

through holes in the vertical flanges of the blocks; these flanges are  $4\frac{1}{4}$  in. deep by  $\frac{5}{8}$  in. thick. The body of the grate is flanked on each side by wrought chains comprised of binder links carried on the ends of the transverse rods. A certain proportion of the grate blocks are driving blocks and have rollers mounted on the binding rods between the vertical flanges of the blocks, as in the right hand block of Fig. 2, to engage the sprocket wheels. The latter carry the grate and are mounted on 4-in. shafts at the front and rear which run in roller bearings.

All of the rear sprocket wheels are keyed to their shaft, while those on the front shaft, with one exception, run loose; the purpose of this construction is to relieve the chain of strain due to unequal expansion or contraction. The rear sprocket shaft is driven through a worm wheel by a worm on a shaft extending to the front of the grate, where power is applied to this shaft through a worm wheel from a worm on the driving pulley shaft. All gears are inclosed in dustproof cases and run in oil baths. It will be seen that the drive is such that the coal burning surface of the grate is pulled from front to rear and, the front shaft being an idler, the sag of the chain is underneath and the upper surface of the chain

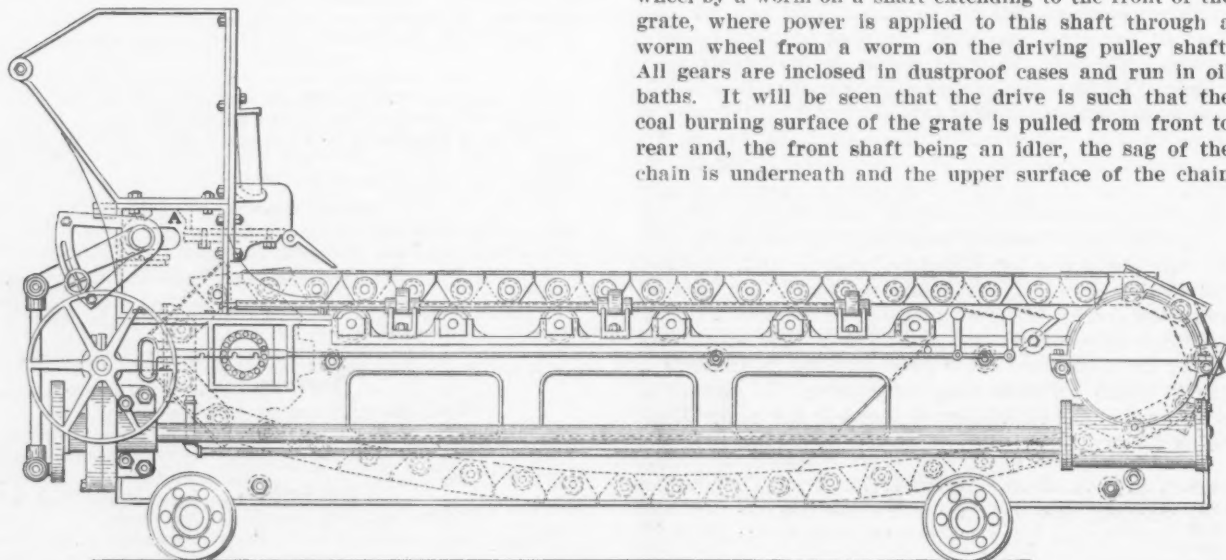


Fig. 1.—Side Elevation of the Automatic Traveling Chain-Grate Stoker Built by the Wallis Stoker & Mfg. Company, Terre Haute, Ind.

parture from common practice, is the method adopted for propelling the chain which, contrary to the usual plan, is pulled from front to rear by power applied to the rear chain shaft. Another innovation is the provision for exposing each charge of fresh fuel to the heat of the furnace before depositing it on the grate; the purpose being to coke the coal, so that the finer particles of fuel will not sift through into the ash pit on striking the grate.

From the drawing shown in Fig. 1 a general idea may be had of the design and arrangement of the component parts of the machine. The chain and driving mechanism are supported by a carriage composed of heavy cast iron side frames joined by transverse steel rods passing through pipe distance pieces and secured at the ends by nuts. The grate chain is composed of rectangular link blocks, views of which, in different positions are given in Fig. 2. These are 12 in. long by 6 in. wide and have center webs  $1\frac{3}{8}$  in. thick, with air openings of herring-bone pattern. They are connected together in staggered relation, to form a continuous surface, by  $1\frac{1}{8}$ -in. steel rods passing transversely underneath the grate surface

is kept taut and level. The importance of preserving a smooth even grate surface is apparent from the fact that unevenness would not only permit the fine fuel, such as is usually used, to sift through and waste, but would expose the ends of links projecting above the level to the direct action of the fire and consequent damage from burning.

Coal is supplied from a hopper equipped with an adjustable stroke pusher, providing a positive and easily regulated feed, the driving mechanism of which is clearly shown at A in Fig. 1. The pusher is operated through a rack and segment pinion oscillated by a lever connected to a crank on the shaft which drives the chain. The pusher is a plate fitted in the bottom of the hopper, and having a vertical face. When it is withdrawn—i. e. makes a stroke to the left, as viewed in Fig. 1—the coal above it drops on the stationary or floor plate of the hopper. On the return stroke of the pusher a charge of coal, equal in depth to the height of the vertical face of the pusher and in length to the width of the grate, is pushed forward into the firebox. By loosening a hand wheel the feed can be

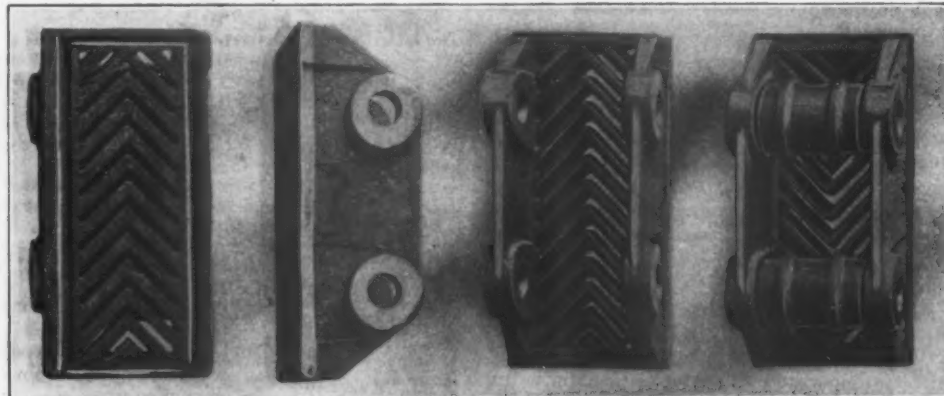


Fig. 2.—Different Views of the Blocks Which Form the Chain Grate.



changed in quantity by altering the position of the pusher stroke so that more or less coal falls in front of it at each cycle. Upon entering the firebox the charge is not dropped directly upon the grate, but is deposited on a solid iron coking plate attached to the rear of the hopper above the grate. As now made the grate openings provide for a little more than 30 per cent. of air space.

Connected with and forming part of the equipment, as shown in Fig. 3 though not in the drawing, is a cast iron spiral ash conveyor which passes the ashes and clinkers forward beneath the stoker and deposits them in a con-

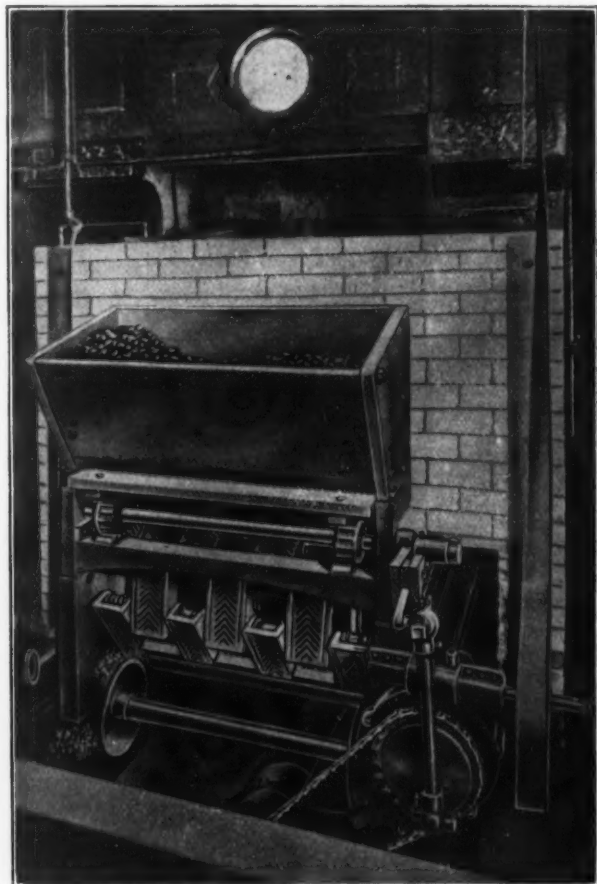


Fig. 3.—View from the Front of a Wallis Chain-Grate Stoker Installed.

venient pit at the front of the boiler. Roller bearings are provided for all the principal journals and all parts of the machine are interchangeable.

### By-Product Coke and the Foundry Trade.

Following is a report of the address on "By-Product Coke," delivered before the Pittsburgh Foundrymen's Association June 1 by Charles E. Pope of the Coal & Coke By-Products Company, Pittsburgh:

The speaker began with a description of the character of coal deposits and turning to the use of the beehive oven in wood and charcoal burning and its adoption in the present manufacture of coke. He said the beehive type of oven accomplished only one purpose, which is the coking of coal, as it burns all the gas, tar, ammonia, besides 20 per cent. of the coal over the Rothberg. This is a closed oven, heated by means of horizontal flues between the coking chambers in which the coke can be charged loose or stamped, thus coking the coal and preserving all the valuable by-products, the coke being controlled in quality and manufactured on a scientific basis to answer the foundrymen's requirements. The retort oven, in his opinion, is the oven of the present and future and the beehive that of the past. He claimed that, although opposed by about 90 per cent. of the coke manufacturers, the by-product oven is coming into use, on account of its saving and its being able to produce a suitable coke for the foundry from a lower grade of coal than the beehive oven. The output of by-product coke is steadily increasing and

it is only a question of time until, on account of its superior quality, it will lead.

Mr. Pope referred to the recent meeting called by President Roosevelt for the purpose of discussing the protection of our natural resources, coal being one of the matters that received attention. Coal is being burned up shamefully every year, its valuable by-products are wasted in millions of dollars, and it is necessary that we economize and get the benefit of this waste. He stated that some foundrymen are opposed to the use of by-product coke on account of its black appearance, but that this did not affect the quality of the coke. This black appearance is caused by its being quenched on the outside of the oven, while the coke with the silvery appearance, quenched inside the oven, would have the black appearance were it treated as the former. Foundrymen are ahead of blast furnace operators in using by-product coke in greater tonnages, they having investigated the matter and ascertained that it would answer their requirements by being hard, dense, burning quickly and fiercely, and its carrying the burden of pig iron, besides enabling them to specify and receive the grade they require.

He made a suggestion to the effect that the firms represented, the association as a body or the American foundrymen's Association erect their own by-product coking ovens. They would thereby effect great savings in the by-products and get their coke when they wanted it and in the quantities and grades desired. This in turn would greatly benefit their casting business by, first, bringing up the average profits and, second, increasing their trade to the extent of supplying castings to new by-product coke companies that are sure to come in the near future. He estimated such requirements on the basis of 1000 tons of castings for each 500 tons output per day of by-product plants erected.

### The Proposed Institute of Chemical Engineers.

The committee appointed at Atlantic City last June to consider the formation of an American Institute of Chemical Engineers, has found (after obtaining the votes of the chemists of this country) that there is a strong sentiment for bringing together into closer relationship those men who more particularly specialize in chemical engineering. A very decisive vote has been received in favor of the formation of the society, and a circular issued by W. M. Booth, temporary secretary, Syracuse, N. Y., calls a meeting for the purpose of organization. This will be held at the Engineers Club, 1317 Spruce street, Philadelphia, June 22.

The following programme has been arranged: At the morning session, beginning at 10.30, the visitors will be welcomed by Prof. Samuel P. Sadtler, after which Dr. Chas. F. McKenna, chairman of the committee appointed at Atlantic City, will address the meeting on "The Justification of the Institute of Chemical Engineers." Committees will then be appointed on Plan and Scope, Organization, Nomination of Officers, &c. At the afternoon session, beginning at 3.30, reports of the committees will be heard and action will be taken thereon. The election of officers and the perfection of the organization will take place at the evening session. Short addresses by eminent chemical engineers will be made during the evening.

As the outcome of the views expressed in response to the circular letters and at subsequent meetings, it seems probable that membership will be established on the basis of extent of practice in chemical works or in technological applications of chemical principles on a large scale.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, has recently completed plant extensions and improvements, which included the construction of a new foundry, the remodeling of the machine shop, and the addition of a number of new machines, among which are a Landis crank grinder, Barrett cylinder boring lathe, turret head lathe and a stationary and radial drills. As a result of these improvements, the capacity of the plant has been increased about 40 per cent.



### The Blake-Knowles High Vacuum Pump.

For years the mercury air pump was the only successful means for exhausting air to the high degree required in making incandescent lamps and in laboratory use, &c., but it is exceedingly slow in its operation. The accompanying Fig. 1 shows a belt driven vacuum pump, made by the Blake & Knowles Steam Pump Works, 115 Broadway, New York City, which is especially designed to produce a substantially perfect vacuum for commercial purposes. The pump illustrated is in the Westing-

inders for direct steam drive, and with extended bases and gearing for electric motor drive. The vacuum cylinders are thoroughly water jacketed. The valves are mechanically operated by eccentrics keyed to the main shaft.

Experience with work where the highest possible degree of vacuum is required has shown that the correct practice is to handle the air by means of two air cylinders—that is, in two stages—one cylinder discharging into the other. By thus reducing the difference in pressure between the opposite sides of each piston it is possible to

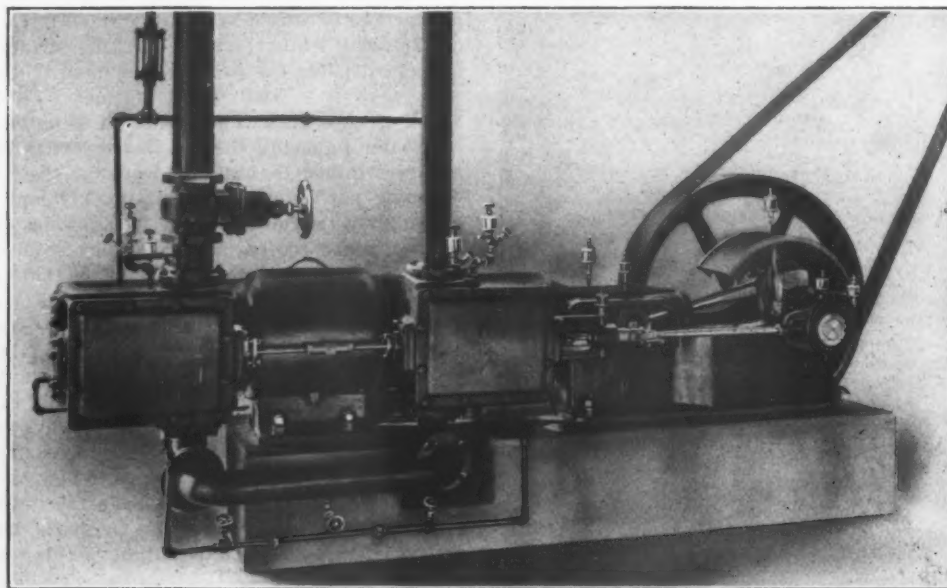


Fig. 1.—The Two-Stage Rotative Dry Vacuum Pump, Type LV, Built by the Blake & Knowles Steam Pump Works, New York.

house Electric Lamp Company's plant at Watsessing, N. J. It is a two-stage pump, having two vacuum cylinders 12 in. in diameter by 12 in. stroke, intended to run at 100 rev. per min. It will produce a vacuum of within 0.02 in. of the barometric height as registered by the mercury gauge, which is shown in the engraving. The pump withdraws the air from a closed receiver which is piped to the stands containing the incandescent lamps to be exhausted. The large capacity of the pump and its ability to produce a high vacuum particularly adapt it to this class of service. It works strictly on the dry system, as no water is necessary or permitted to enter the cylinders. It is also adapted for all other work where an exceedingly high vacuum is desirable, as in connection with the evaporative processes of sugar re-

take care of the leakage past the piston rings, &c., that may occur in the intake cylinder, which, however slight, seriously affects the capacity and efficiency of the pump on the higher ranges of vacuum.

This successful production of a machine, not difficult of management and capable of maintaining an extremely high vacuum, has revolutionized many industrial processes and has opened up new possibilities in the arts. Particularly in the case of incandescent electric lamp bulb manufacture the above type of machine has proved its value. It has symplified former methods and has made less difficult and expensive the rapid production of finished bulbs.

A further and more extended application of these pumps is, as mentioned, in the production of high vacuum in connection with evaporative processes, &c. With every fractional part of an inch gain in the high ranges of vacuum, the boiling point temperature is reduced in a much greater proportion, so that with a given apparatus the higher the vacuum the greater its capacity, and, incidentally, the greater the improvement in the quality of the product.

Fig. 2 shows a set of indicator cards taken from the two vacuum cylinders. It is interesting to note the difference in the work performed by the intake or suction cylinder and that of the final cylinder. The latter cylinder does by far the majority of the work, while the intake cylinder produces just that fraction of an inch of vacuum which reduces the resultant pressure to practically absolute zero. This machine is manufactured in larger and smaller sizes suitable for various capacities.

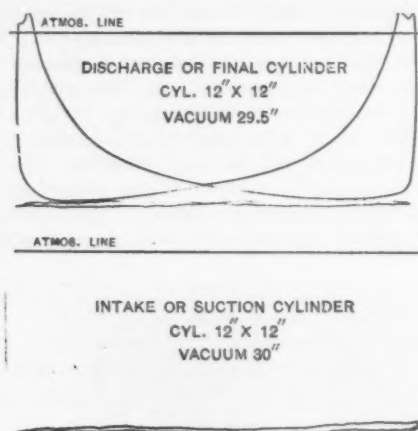


Fig. 2.—A Set of Indicator Cards from the Two Vacuum Cylinders.

fineries, distilling plants, chemical and dye works, glue works, salt works, soap works, the manufacture of prepared foods, medicines, essences, glycerine, &c., preserving processes and the production of high vacuum in central steam condensing systems and steam turbine work.

These vacuum pumps are also built with steam cyl-

E. R. C. Clarkson & Sons, Toronto, trustees, receivers and liquidators of the Canadian Shipbuilding Company, announce that negotiations have been going on for some time, and are now reaching what is believed will be a satisfactory conclusion, for the granting by the Canadian Government of a yearly bonus of 3 per cent. for 20 years upon the cost of the proposed drydock at the Bridgeburg yards—inclusive of the cost of the works previously erected there by the company.

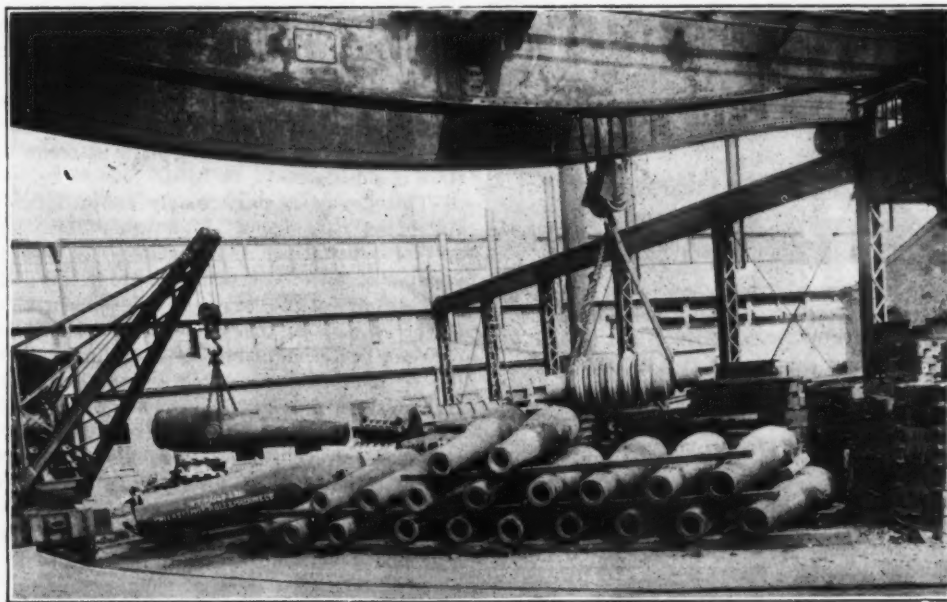
### Old Cannon Utilized for Rolls.

The form and size of discarded cannon militate against their being commonly utilized as a scrap material. The cost of handling and breaking is so high as to prove prohibitive except to those engaged in the manufacture of a product which demands an especially high quality of material. To those so engaged, however, the old cannon discarded by the Government are exceptionally valuable. Among the largest and most successful of those whose product demands such material ranks the Philadelphia Roll & Machine Company, Philadelphia, Pa. This company manufactures cast iron sand and chilled rolls and general machinery for rolling mills, as well as dies, gearing and general castings for which the quality of the material has to be of the highest grade. It is enabled to meet these requirements largely through the use of cannon, the strength of which forms one of the essential qualifications of its product. The company thinks so highly of the quality of the material in these old cannon that it is constantly buying large quantities of them, and whenever there is such a sale by the Government it is in the market for them.

The accompanying illustration shows a portion of a

large breaker of the gravity type, where the gun is broken into pieces corresponding to the cuts previously made. They are next loaded into large furnaces of special construction and melted, together with a proper quantity of high grade charcoal iron. This molten mixture is drained into ladles which are provided with suitable means for pouring the metal. The ladles are then raised by large electric traveling cranes and carried to the previously prepared molds. The larger part of these molds are for rolls. After the molten iron has cooled and thoroughly hardened, the molds are removed and the rolls are taken into a machine shop, where all parts are turned perfectly round, and they are then ready to be shipped to the rolling mill where they perform their active work on iron, steel, brass, copper, nickel, silver and gold in all variety of shapes.

Thus these discarded, obsolete and apparently worthless cannon play a very important part in our daily existence and progress. Their life does not even then end with the life of the rolls of which they form a part, for after these rolls are worn out or broken they are sent back to the manufacturer, who again remelts them, with other high grade pig iron and some fresh pieces of cannon. They are again cast into new rolls, which in their



Old Cannon Utilized for Rolls.—A Scene in the Yard of the Philadelphia Roll & Machine Company.

large consignment of guns recently purchased. The majority of these guns had been cast at the West Point Foundry many years ago, and at the time of their manufacture were the latest and strongest type of gun. After finishing they were subjected to a rigid inspection and some of them were sent to old forts, while others were placed at points along the seaboard as coast defense guns. All of them played an important part in the history of our country. Their weights range from 15,000 to 50,000 lb., the coast defense guns being of the latter type. Some conception of the size of these guns can be formed from the fact that only one can be shipped on a modern freight car. The illustration shows one of the smaller type guns suspended and also a rolling mill roll, which is one of the company's principal products of which they are destined to form an essential part. The illustration is also of interest as showing the facilities provided by the Philadelphia Roll and Machine Company for handling heavy materials and products in its yard.

After the arrival of the guns at the works they are cut into pieces weighing from 3000 to 5000 lb. This cutting presents one of the many problems connected with the utilization of the larger type guns, and is performed in very large lathes of especially heavy construction and strong design. The cuts are only extended a limited distance into the material, as it is dangerous to the machine to make the cuts sufficiently deep to risk any chance of premature breakage. After enough of these cuts are made the gun is removed from the lathe and taken to a

turn go out and perform the work of their predecessors, and this process will probably be continued as long as any old cannon can be obtained.

Joseph T. Ryerson & Son, Chicago, have moved their general offices and warehouses from Milwaukee avenue and Lake street, where they had been established for many years, to Sixteenth and Rockwell streets. For a long time a considerable part of their business has been conducted there, but they have just completed a new building for general offices and extensive warehouses. The new plant affords exceptional facilities for the handling of iron and steel stocks, including the modern equipment of electric traveling cranes and commodious railroad trackage for loading in and out. Downtown branch offices have been established in the Commercial National Bank Building, corner Clark and Adams streets. An hourly automobile service will be maintained between the general and branch offices for the convenience of their patrons.

The R. D. Nuttall Company, Pittsburgh, has added to its already comprehensive list of gears and pinions the well-known Titan brand of manganese steel gears and pinions, having arranged with the Atha Steel Casting Company for the exclusive sale. This places the Nuttall Company in a position to furnish practically everything in the way of gears and pinions for the requirements of traction and electric railroad service.

## The Pond Sash Operating Device.

A device for opening and closing pivoted windows and louvers, which consists of few parts and is easily operated, has been designed by Clarke P. Pond of the David Lupton's Sons Company, Philadelphia, Pa., and is manu-



Fig. 1.—A Monitor with the Pond Operating Devices Made by David Lupton Sons Company, Philadelphia, Pa.

factured and sold by that company. It is so constructed that the force is exerted with the greatest leverage at the time when the greatest is needed, that is when the pivoted sash is in a perpendicular position and in contact with



Fig. 2.—The Operating Gear and Transmission Bracket.

the frames, and the leverage decreases and again increases in proportion to the load, so that a minimum amount of power is required for operation. This will be understood from Fig. 1 which shows one line of windows open and the opposite side closed. The power is

applied through an operating gear, which (if all the sashes are to be opened or closed at once, which is quite feasible in buildings of considerable length by this method) is placed at one end of the building and the power is transmitted by tension through a flexible rod to the hinged levers attached to each side of each sash. No torsion enters in and no friction other than that in the pivots of the levers.

The operating gear, which is shown in Fig. 2, is carried on a hinged bracket, and is driven by a chain through a cast iron wheel 12 in. in diameter. The latter carries a steel worm meshing with phosphor bronze worm wheel, both immersed in oil, and all the bearings are of phosphor bronze. Two small drive wheels are attached to the worm wheel and transmit the power through short lengths of chain to steel cross arms connected at their centers to the operating rods. A flexible transmission bracket is placed at the opposite end of the drive, over which a length of chain passes and connects the other ends of the rods.

The compound levers or arms on each side of the sash are connected directly to the flexible transmission rods. These are so designed as to exert the greatest power when the sash is closed and in an upright position. All the bearing points on the arms or levers are bushed with phosphor bronze, so that friction is minimized at all points and a greater capacity given the complete system.

Special dies are used in making the various parts of the apparatus, the material used is carefully selected, and the uniformity in manufacture make it possible, with the small amount of friction developed in the operation of the device, to obtain results with material of less weight than could otherwise be used.

This device is particularly adapted for powerhouses, foundries, workshops and other buildings requiring special ventilation, as it enables by one operation the opening of all of the windows from one point and therefore permits of the escape of gases or smoke more rapidly. If the opening of the windows in sections is desired this also can be accomplished by installing the necessary number of operating gears, or special arrangements in the transmission rods are made when operation in a straight line is interfered with by traveling cranes or other obstructions, preventing the use of standard fixtures.

Fig. 3 shows an installation of the Pond sash operating device, at the powerhouse of the Union Terminal at Washington, D. C., which is somewhat unique. In this case one gear controls three lines of sash, each 200 ft. long, or 600 lineal feet of sash, comprising 1100 sq. ft. of surface, there being 99 sashes. A 15-lb. pull on the operating chain is sufficient to operate the sash—which indicates the ease with which this device is operated. The louvers in the two lower rows are operated from the upper row being connected therewith by vertical rods and brackets, so that all are controlled by one gear.

Gulick-Henderson & Co., engineers' and founders' laboratories, have installed an engine and generator in their establishment at 439 Third avenue, Pittsburgh, for furnishing power for the furnaces and testing machines.



Fig. 3.—An Installation of the Pond Sash Operating Devices in the Power House of the Union Terminal, Washington, D. C.



### Tariff Revision Plans.

WASHINGTON, D. C., June 9, 1908.—The announcement by Chairman Payne of the House Ways and Means Committee to the effect that until after the November elections his committee will not avail itself of the privilege granted it by a special resolution of the House to sit during the current Congressional recess may be supplemented by a statement made by Senator Aldrich that the Senate Finance Committee will not take up any phase of the tariff question until after the elections. The industries of the country, therefore, will not be obliged to contend with any form of tariff agitation before the elections, and it can be stated on high authority that this was the object in view when the tariff discussion at the recent session was brought to an end by the passage of resolutions authorizing the Ways and Means and Finance committees to sit during the recess.

#### Relation of Duties to Cost.

While no formal sessions of the committees will be held during the recess, much valuable data will be gathered to be used in the projected tariff revision. A task to which the experts of the Ways and Means Committee are preparing to address themselves is the drafting of comparative schedules for the purpose of showing the relation of the rates of the Dingley act to the cost of articles covered thereby both at the time the law was passed and at the present date. An important feature of that law was the transformation of a large number of ad valorem rates of the Wilson act into specific rates, the object being to prevent the undervaluation of importations and the consequent reduction in revenue. Theoretically, the ad valorem principle of tariff duties is ideal, especially in that the rates readjust themselves automatically to increases or decreases in foreign market price or cost of production, but experience under the Wilson act, in which many specific rates of the McKinley law were transformed into ad valorem rates, was so unsatisfactory that Democratic Secretaries of the Treasury were among the strongest advocates of a return to a specific duty basis. An investigation made under the authority of the Treasury Department demonstrated beyond question that reputable importers were driven out of certain lines of business because of the wholesale undervaluations of unscrupulous competitors.

#### Basis for Revision.

As a basis for the revision of the Dingley act, however, it is necessary to transform all the specific rates of the existing law into ad valorem rates as of the date of 1897 and as of the present date. It may be assumed that, all other things being equal, where the foreign market value and domestic cost of production of an article have declined materially, so that the existing rate of duty is a much greater ad valorem to-day than it was when the Dingley act was passed, such rate will be subject to reduction; provided, of course, that present conditions promise to be reasonably permanent. In the case of articles now paying ad valorem rates or compound rates in which the ad valorem factor predominates there would be no necessity on this score of making a change in existing rates.

As has already been stated by the majority leaders on the floor of the House that the Ways and Means Committee contemplates a maximum and minimum, or dual, tariff, such a basis is now maintained by Germany, France, Russia and other important commercial countries. It is clearly understood, however, that the minimum tariff will afford as much protection to American industries as the Republican leaders believe they should enjoy under any circumstances, and the method pursued in the preparation of the twin schedules will be to fix the minimum rates as if an independent, single column tariff were in course of preparation, and subsequently to prepare the maximum schedule by adding to these rates from 20 to 50 per cent., except in the case of a few articles which are not produced in the United States and which do not offer opportunities for negotiating advantageous reciprocal trade agreements with foreign countries.

It is already obvious that the forthcoming revision of the tariff must be along revenue lines and with a view

to a decided increase in the national income. The present condition of the Treasury is such as to cause the Administration very serious concern, and the great problem before those who undertake to revise the Dingley act will be how to secure an increased customs revenue without stimulating importations to a point that would threaten the prosperity of domestic industries.

In view of the big Treasury deficit now in sight it would not be surprising should the next revision of the revenue laws include important changes in internal taxes made with a view to permanency. The most probable course is the reimposition of certain documentary stamp taxes which are widely distributed and easily collected, and which bear but lightly on the people after they have become accustomed to the change. The minority in Congress has already fixed upon a graduated income tax as a proposition that will be urged in lieu of documentary stamp taxes and to meet the argument that reductions in tariff duties, and especially the transfer of certain articles to the free list, may decrease the revenue below the danger point.

W. L. C.

### Canada's Lead Bounty.

TORONTO, June 6, 1908.—The Minister of Finance has given notice of a resolution which is to be the basis of an amendment to the act respecting bounties on lead. The five-year period covered by this act expires June 30, and the effect of the amendments summarized in the resolution is to renew the bounties for another five-year period. But the conditions to which the payment of the bounties is subject are to be modified. At present the bounty is greatest when the standard price of pig lead in London, England, does not exceed £12 10s. per ton of 2240 lb. At or below that price the bounty is 75 cents per 100 lb. on the lead in lead bearing ores mined in Canada. When the London price exceeds this minimum the bounty rate is reduced by the amount of such excess. Thus, when the London price is higher than £12 10s. per ton by the equivalent of 10 cents per 100 lb. the bounty declines 10 cents—that is, to 65 cents per 100 lb. When the price rose to £16 per ton the bounty vanished. Another limitation is that the total sum paid on lead bounty account shall not exceed \$500,000 in any fiscal year.

The amendment outlined in the Finance Minister's resolution is in response to the urgent petition of the silver-lead mining and smelting interests of British Columbia, which petition was presented by a strong deputation that waited on the Government last winter. Two requests were submitted—first, that the bounty be renewed for another five-year period; second, that the minimum price specified in the act be raised. As has already been stated, the renewal of the bounty is provided for in Mr. Fielding's scheme of amendment, the rate to be the same—namely, 75 cents per 100 lb. The second request of the petitioners is also complied with, for the minimum price is to be raised from its present amount of £12 10s. per ton to £14 10s. This is an extremely important concession to the lead producers, inasmuch as it permits them to enjoy the full benefit of the bounty, even after the market has advanced £2 per ton. Another change proposed by the Finance Minister is the removal of the restriction upon the total amount payable on lead bounty account in any one fiscal year. Under his amendment the Government may, if it pleases, pay out more than \$500,000 in one year. The restriction, however, comes in at another point—the total sum payable on this account in the five years is to be not greater than \$2,500,000. Consequently if the mines and smelters are active and copious in their productiveness they may in less than five years exhaust the sum at the Government's disposal on lead bounty account. In the last five years the amount paid in lead bounties was \$617,000.

According to the annual report of the Minister of Mines for British Columbia 47,738,703 lb. of lead was produced in that province in the calendar year 1907, the market value being \$2,291,458. This is 4,669,514 lb. less than the output for 1906. Of the total nearly 7.9 per cent. came from the Fort Steele mining division.

C. A. C. J.

## Direct Air Pressure Pumping.

Last year extensive experiments on pumping by direct air pressure were made near the Westinghouse Air Brake Company's plant at Wilmerding, Pa., to determine the amount of water raised, air required, &c., using different sizes of pipe and different combinations of lift and submergence. The lift is the vertical distance from the water level in the well to the point at which the water is discharged, and the submergence the distance from the water level to the point in the well where air is admitted to the discharge pipe.

### Arrangement of Apparatus.

The well is 174 ft. deep from the surface of the ground, has a 6-in. casing and the water level is ordinarily from 16 to 20 ft. below the surface. A tower was constructed over the well with platforms at various heights corresponding to different lifts. The lower part of the tower was inclosed to house the tanks, measuring

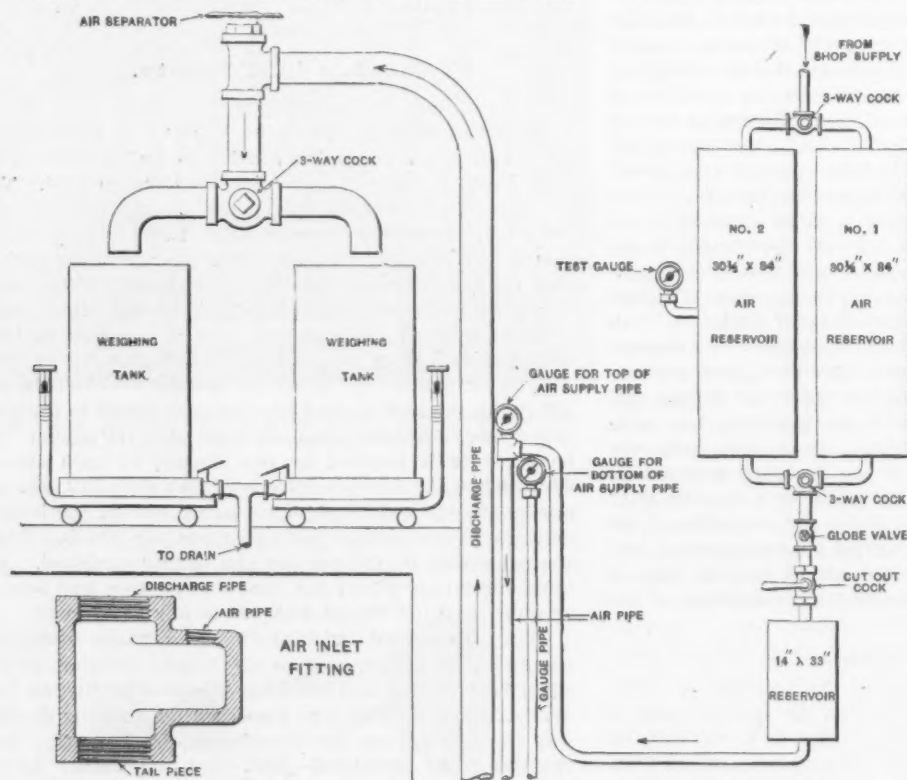


Fig. 1.—Piping Diagram of the Direct Air Pressure Pumping Tests Made by the Westinghouse Air Brake Company.

apparatus, &c. The distance to the air inlet and to the point of discharge was obtained by measuring each length of pipe introduced, and the distance from the ground to the water level by using a float, consisting of a sealed tin tube  $\frac{1}{2}$  in. in diameter and  $4\frac{1}{2}$  ft. long, weighted at the bottom and attached to a graduated cord.

The air supply was obtained through a 1-in. connection to the shop compressed air system, the pressure of which ranges from 140 to 160 lb. The arrangement of piping, reservoirs, &c., is shown diagrammatically in Fig. 1. Two air storage reservoirs,  $30\frac{1}{2} \times 84$  in. received air from the supply through a three-way cock, so that only one tank could be charged at one time. At the other end of these tanks connection was made through a similar three-way cock to the line to the well. In this line was placed a  $14 \times 33$  in. reservoir, a globe valve and a cut out cock. Tank No. 2 was used for measuring the air in the tests and tank No. 1 for starting the pumping operation. The volumes of these tanks and their piping was measured by filling with water. A special test gauge was attached to tank No. 2 and the globe valve in the well line regulated the pressure in the tank to keep it constant. The cut out cock was used for cutting off all supply to the well. The small reservoir simply increased the volume of the well line to make it easier to hold its pressure constant.

The special fitting used for admitting air into the discharge pipe is also shown in Fig. 1; the upper surface

of its enlarged part was drilled and tapped for three air pipes and  $1\frac{1}{4}$  in. gauge pipe. With the large discharge pipes there was not room enough inside the casing to get a large air supply pipe, so that two or three smaller sizes were substituted. By this arrangement, also, the effect of changing the sizes of air supply pipes was easily obtained, since any one of these pipes could be closed at the top by suitable cut out cocks. The gauge pipe was connected with a test gauge to show the pressure of the air entering the well. The water is always blown out of this pipe when starting the pumping operation. Another test gauge was placed in the air line to the well, so that pressures at the top and bottom of the air inlet pipe were noted.

The discharge pipe passed up through the roof of the tank room to the point of discharge, where the air and water lifted passed into an air separator, shown in Fig. 2, the air escaping to the atmosphere and the water falling into one of the two weighing tanks. Just under the roof was a large three-way cock, by which the water was

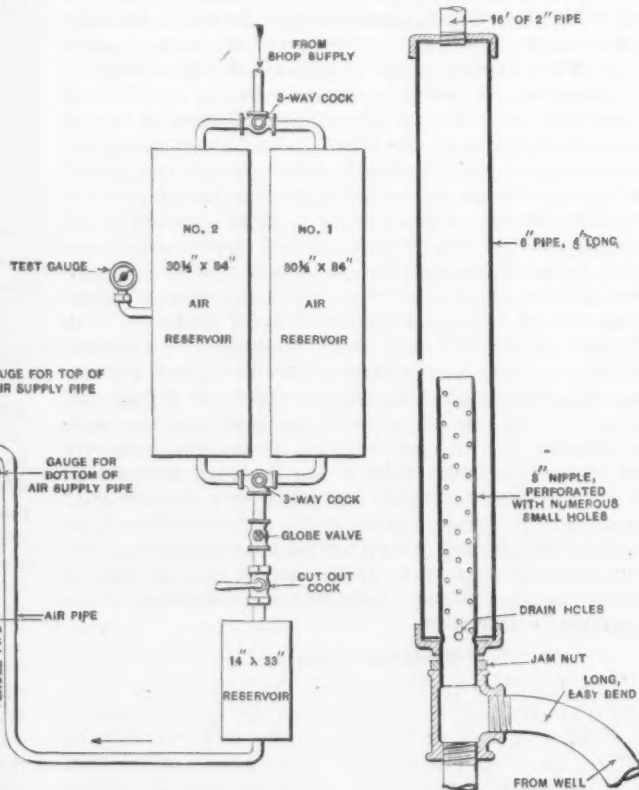


Fig. 2.—Air Separator and Top of Discharge Pipe.

directed into either tank to be weighed on platform scales.

### The Tests.

Nearly 1800 tests were made, covering from 350 to 400 different combinations of discharge pipe, lift and submergence. From the figures obtained in these tests, curves were plotted showing the variation in cubic feet of air used per gallon of water raised and the gallons of water delivered per minute for the different ratios of lift to submergence, and it was found that they are practically the same for each ratio of lift to submergence for any submergence of a given size of discharge pipe. For example, a lift of 10 ft. and a submergence of 20 ft. will take the same amount of air per gallon or lift the same number of gallons per minute as a lift of 100 ft. and a submergence of 200 ft., the size of discharge pipe being the same. In both cases the ratio is identical, while the submergence in the second is 10 times that in the first. It was also found that, for a given size of discharge pipe the gallons of water raised per minute decreases as the ratio of lift to submergence increases. Also, the cubic feet of free air per gallon of water raised increases as the ratio increases for a given size of discharge pipe and for a given ratio it decreases as the size of discharge pipe increases.

### Air Pressure.

It was found that the lowest air pressure possible that would give a continuous flow from the well was the



proper one to use. Slightly reducing the pressure caused the water to issue intermittently, and although the air required per gallon was less than with the continuous flow the water delivered was considerably less. Gradually increasing the pressure above that required for a steady flow somewhat increased the quantity of water delivered, but the air per gallon increased in greater proportion and, as the air pressure is further increased the gain in the quantity of water delivered grows less, until, at a certain point, it stops, and from then on the water delivered decreases in amount. It is very easy to regulate the air supply by the sound of the discharge. The point at which the flow becomes steady is quickly recognized.

#### Proper Ratios and Other Considerations.

From the results obtained it would appear that for a given lift the deeper the submergence the more economical the result. This is true as far as the well is concerned, but it must be considered that the greater the depth of the air inlet the greater the air pressure must be. Fig. 3 shows a compound arrangement of piping for pumping from a shallow well to get the effect of a deep submergence. The quantity of air required to operate the well decreases as the depth is greater, while the horsepower required to compress a cubic foot of air increases with the depth. A curve representing the horsepower per gallon of water raised for varying depths and constant lift will at first decrease as the depth increases, until it reaches a minimum point, after which it increases. This point represents the most economical ratio for the given lift. To learn where this point would be some tables and curves were made, which gave the horsepower per gallon of water raised for the different lifts and different sizes of pipe, with various ratios of lift and submergence, from which it appears that the most economical ratio for a given discharge pipe decreases as the lift increases and for a given lift increases as the discharge pipe increases.

It was found that a tail piece in the discharge pipe below the air inlet is essential when starting the pumping operation, as it tends to prevent the air from backing down into the well and rising in the casing outside of the discharge pipe.

The fitting used for introducing the air into the discharge pipe was particularly well adapted to the purpose, because it offered no impediment to the free passage of the water. The results obtained indicate beyond doubt that anything in the shape of a jet or pipe introduced into the discharge pipe not only has no value in assisting the pumping operation, but is actually detrimental, by forming an obstacle to the free passage of water. The enlarged sleeve not only offers little resistance to the water, but makes it possible to install the air pipe very close to the discharge pipe.

The size of air pipe depends upon the quantity of air required, its pressure and velocity; the latter depends upon the difference in pressure between the top and bottom of the air supply pipe, or how many pounds' pressure one is willing to sacrifice to force the air through the pipe.

Taking the results of the tests and assuming that the drop in pressure is proportional to the length of the air supply pipe, it was found that for 1 lb. drop per hundred feet, the velocity is about 27 ft. per second; for 2 lb. drop, 42 ft. per second, and for 3 lb. drop, 53 ft. per second. Economical operation is more easily maintained by having the drop in air pressure as small as possible.

#### The Action in the Well.

As the compressed air enters the discharge pipe at a pressure only slightly above the hydrostatic head, the column of water above is forced upward. Air continues to enter, filling up the space left by the rising body of water until the top of the water column reaches the discharge opening. The moment that a portion of the rising water is discharged the weight of the column is thereby reduced and the air beneath it will correspondingly expand, thus reducing the pressure on the water in the discharge pipe below the air inlet. The weight of the water in the well, outside of the discharge pipe, then forces the water upward into the pipe, stopping the inflow of air. The pressure in the air supply pipe is

quickly reinstated by its connection with the supply, so that it again forces an entrance into the discharge pipe. This is repeated until the whole discharge pipe, above the air inlet, is filled with alternate bodies of air and water, the combined weight of which is enough less than the water in the well to keep up a constant flow of water into the discharge pipe. As each body of air rises the total weight above it grows less, so that it continues to expand until, when it reaches the discharge, it issues at atmospheric pressure. In this way a continuous flow from the well is maintained as long as a sufficient quantity of air is supplied, and the capacity of the well is not overtaxed.

This action was plainly demonstrated in a model of a

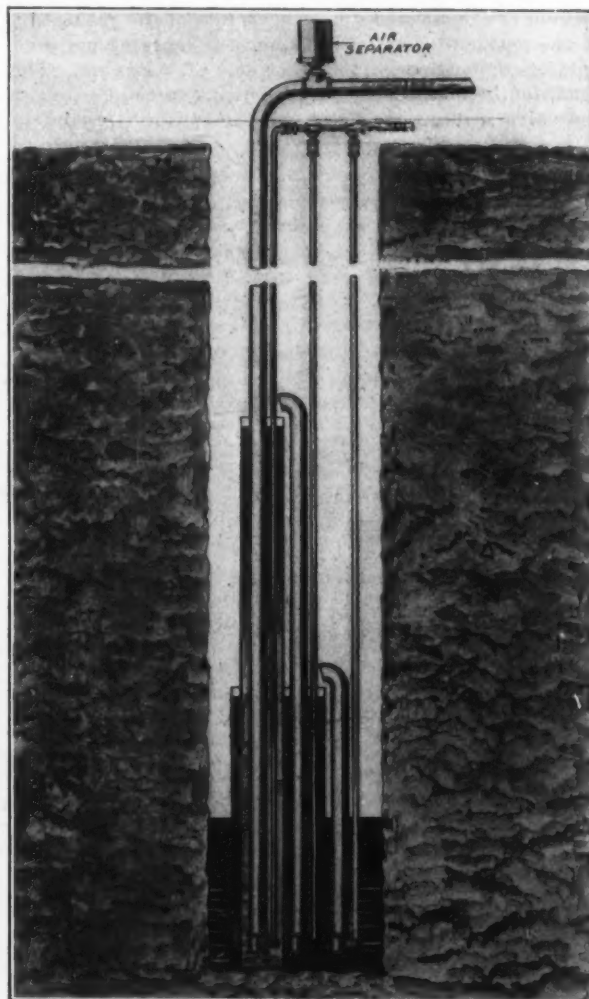


Fig. 3.—A Compound Arrangement for Direct Air Pressure Pumping from Shallow Wells.

deep well, having casing and discharge pipe in glass, and this model also revealed the cause of some of the losses encountered. The principal loss appears to be due to a slip back of a portion of each layer of water to the next succeeding layer, caused by friction with the sides of the discharge pipe. Each change in diameter of the pipe, such as a coupling or joints, materially increases this slip. Also, any obstruction or sudden bend adds to this loss. The bodies of air are not clear, but are filled with bubbles and foam, caused by the presence of the water slipping back, but the bodies of water are clear and distinct.

In starting the well operation it is necessary to admit the air slowly by opening the valve only a little to gradually build up the pressure required. After opening the valve the pumping will not commence immediately, but several seconds, perhaps even a minute, will elapse before the water discharges, then it comes with a rush, after which follows a lull for a few seconds, and then the pumping operation begins more uniformly. The first slight opening of the valve starts the intermittent flow and as soon as gradually increasing the opening produces a continuous flow, the valve should be left in that position.





respect to the narrow spaces at the sides of the hoods. In case of any small leakage the gases must pass between relatively cold and narrow spaces one-quarter of the circumference and then out through a second leak before getting to the other flue. The only result is the accumulation of some tar, which soon clogs the leak. Pits are provided for reaching the lowest seal conveniently. The water in the seal troughs is used up economically through a cascade arrangement of overflow to the lower rings.

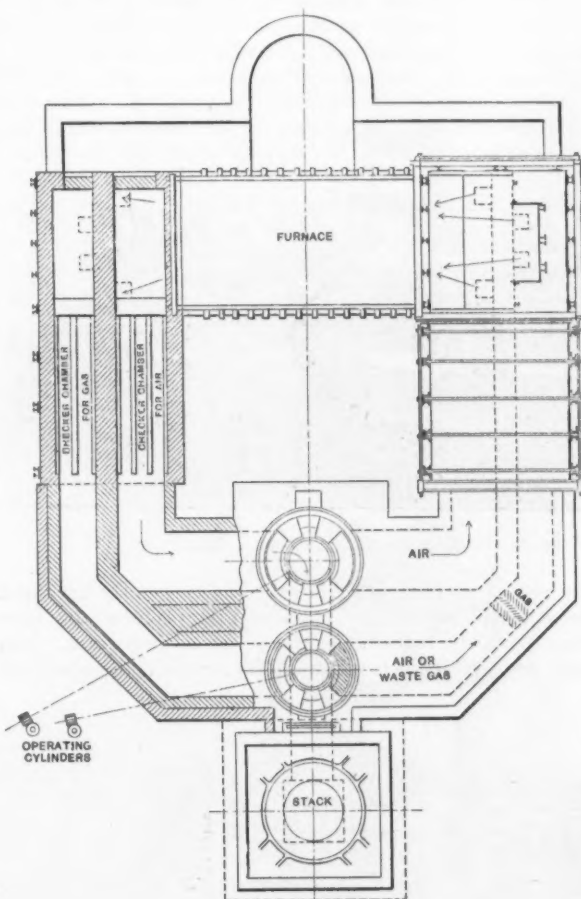


Fig. 2.—Method of Reversing Furnace with Peters Gas Saving Device.

Leaving the cover plates over the flue ports, the valve may be lifted out bodily at any time while the furnace is in operation.

### The Helva Power Hammer.

A new power hammer of the helve type, manufactured by the Novelty Iron Works, Dubuque, Iowa, and known as the Helva Hard Hitter hammer, is here illustrated. It is designed for general service in forge shops and is especially adapted to shaping plow lays, listers, cultivator shovels, and similar jobs common in the average smith shop.

The hammer is simple in construction. The helve is formed of two parallel steel bars connected by separators and bolts with a wooden stiffener between them which increases the rigidity without adding materially to the weight. The helve is adapted to take a reversible hammer die; one end for instance shaped for plow work and the other for general forge work, including the welding of axles, tires, &c., and also for drawing out material of large dimensions. The die is recessed so as to be firmly held between the helve bars and bolts, and requires no key to secure it. The clamp bolts are screwed into one of the bars of the helves and jamb nuts prevent their working loose. The helve is attached to its rocker shaft by three castings; the lower and middle ones encircle the shaft and the middle and upper ones are grooved to bind the helve bars. One V bolt clamps the three castings together.

A foot treadle connected by a rod to a rocker arm engaging the combination belt tightener and brake lever furnishes the means for stopping, starting and controlling the machine. By a slight pressure of the foot on the treadle the brake is released and the tightener pulley simultaneously pressed against the belt. Releasing the treadle reverses the actions, the tightener being removed from the belt and the brake applied stopping the hammer instantly. The force of the blow is regulated by the amount of pressure applied to the lever, and it is claimed that under this control the machine can be made to forge material 5 in. thick or strike lightly enough to hit an egg without crushing. The balanced helve, it is said, enables the operator to strike rapidly on the work, thus retaining the heat in the metal which is being forged.

A feature is the spring drive which is designed to eliminate vibration and undue strain. The driven end of the helve carries a leaf spring the ends of which are connected by links to a pitman in turn connected to a crank on the driving shaft. The leaf spring serves to cushion the reversals of the hammer motion, the arrangement being such that the pitman is on its downward stroke before the dies come together and on its upward stroke before the hammer reaches the limit of its upward travel. By means of a telescoping pitman the hammer may be quickly adjusted for heavy blows required to forge thick material, or to strike lightly at full speed. No adjustment is necessary for light forging at reduced speed since this is accomplished through the sliding tightener operated by the foot lever. A tension spring beneath the



The Helva Power Hammer, Made by the Novelty Iron Works, Dubuque, Iowa.

hammer frame regulates the brake application so that the hammer always stops with the dies separated to receive the work. The tightener and brake may be placed on the opposite side of the driving pulley when that is necessary on account of the direction in which the belt runs. The tightener pulley shank may be adjusted in its holder by releasing a set screw to take up or slacken the belt without altering the position of the treadle so that the proper force of the brake application will not be disturbed. This avoids relacing the belt when it stretches.

The Buckeye Steel Castings Company, Columbus, Ohio, has let the contract to the Mount Vernon Bridge Company for the erection of a large pattern shop. The building will be 60 x 345 ft., of steel construction. The company has already under course of erection another building of similar size in which will be installed a gas producer plant.

## The Garrison Motor-Driven Roll Lathe.

The turning of rolls being necessarily a manual operation, the roll lathe of the past has been a crude machine and hardly an instrument of precision. The improvements made in late years in tool steel and the adaptation

Fig. 2 shows, is unusually simple. The basic change in speed is obtained by throwing the jaw clutch, which is an operation of only a few seconds. A variation of 100 per cent. on this change can be made while the tool is cutting by means of the variable speed motor through the field rheostat. The latter, with the starting rheostat,

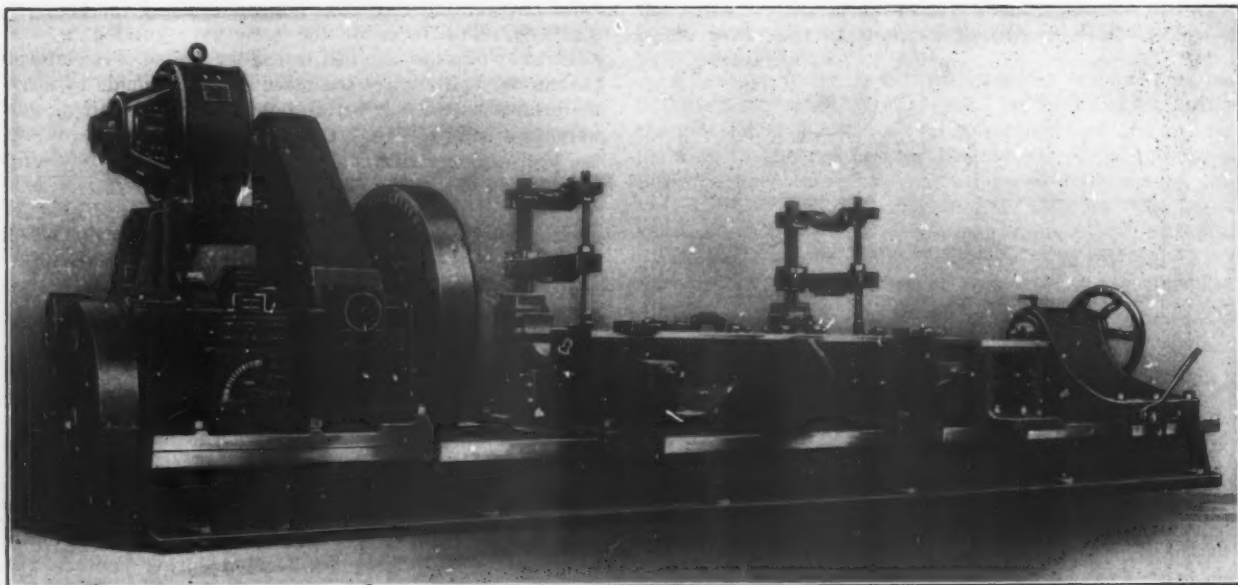


Fig. 1.—A 50-In. Electrically Driven Roll Lathe Built by the A. Garrison Foundry Company, Pittsburgh, Pa.

of the electric motor to the driving of machine tools, have produced a change in this machine that is possibly more marked than in any other similar tool. The 50-in. roll lathe shown in Fig. 1 is the latest design of the A. Garrison Foundry Company, Pittsburgh, Pa., and was built for the Pittsburgh Steel Company, Monessen, Pa. It is capable of turning 48-in. diameter sand and steel rolls. A Westinghouse type S variable speed motor drives the headstock gearing by means of a belt.

Belt drive was adopted for the reason that it has been the builder's experience that a belt of ample size has a life quite as long as a cast iron or even a steel pinion, that it is much more durable than a rawhide pinion or chain, and that it is noiseless, efficient and less expensive, besides providing a flexible connection between the motor and the work, a consideration of very considerable importance. This belt connects the motor and a flywheel pulley. The function of this flywheel is to absorb the intermittent shocks due to the hand feed and the cutting of the wabblers, thereby protecting the motor and increasing the efficiency of the tool.

The gearing, as the detail of the headstock given in

the switch and the pilot lamps is conveniently arranged on a plate, which also incloses and protects the gear wheels. This feature of protection is important. Not only are accidents to or from the gears eliminated, but

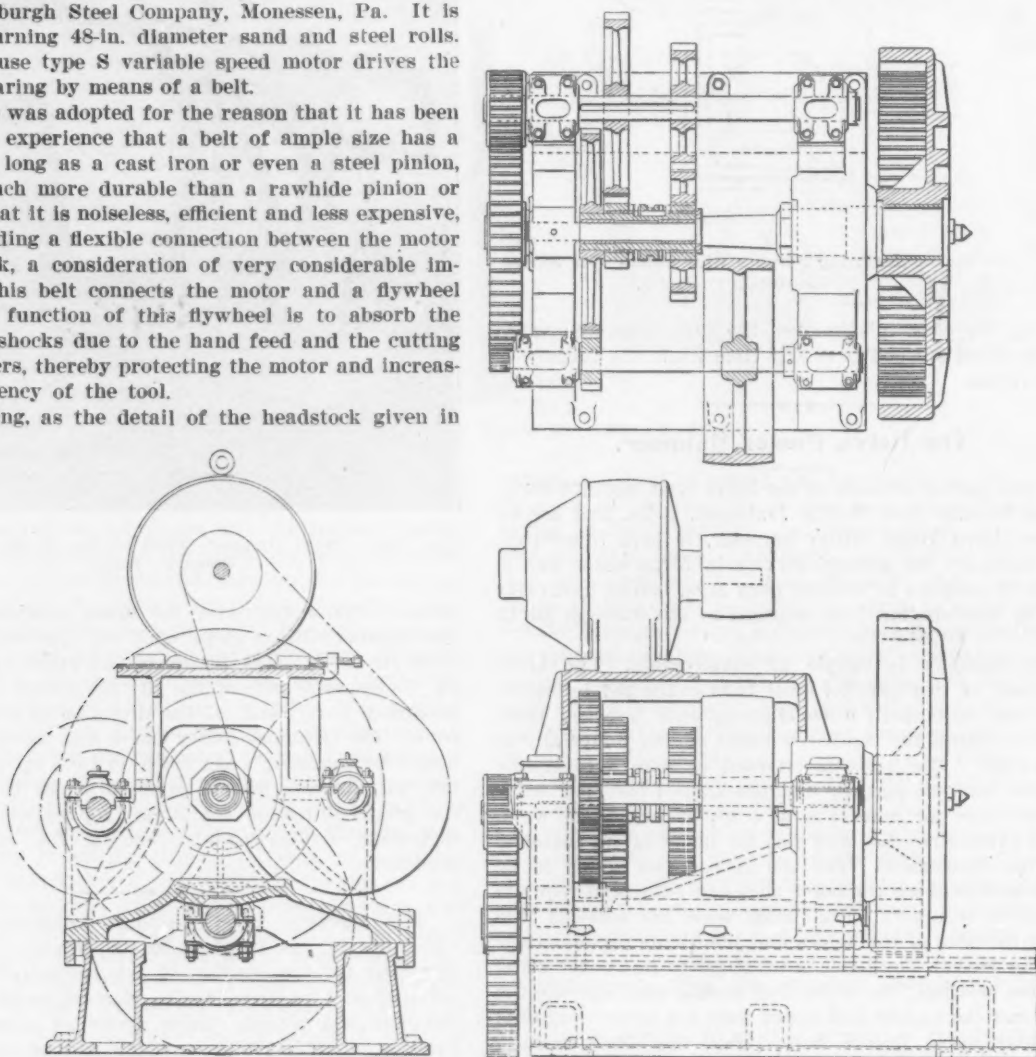


Fig. 2.—Details of the Headstock of the Garrison Motor Driven Roll Lathe.

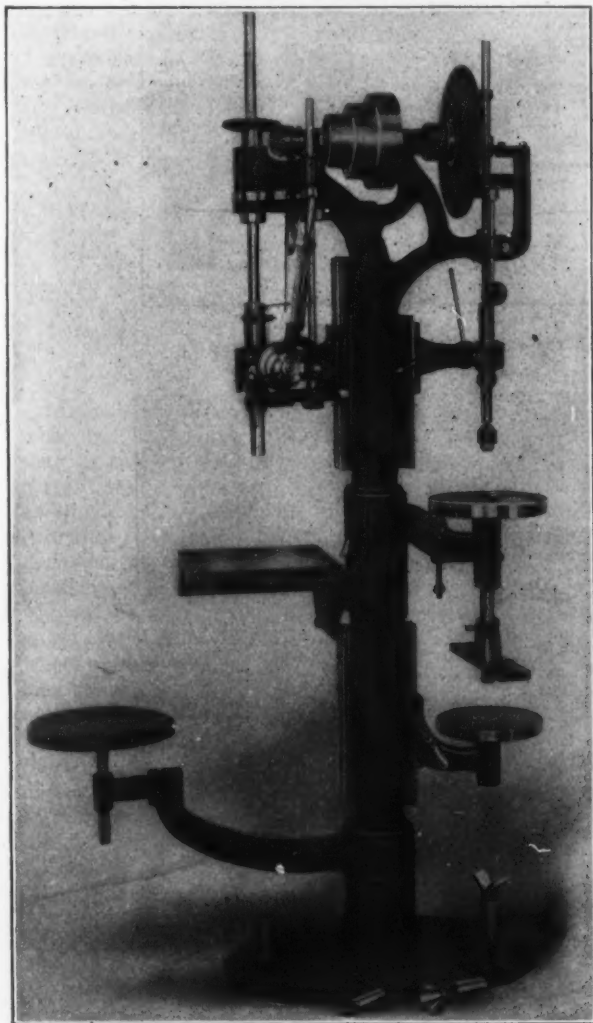


the operator is protected from contact with the accumulations of grease and dust so familiar on the old time tools.

That which the maker lays particular emphasis on is the accuracy of the machining and fitting of the parts. Heavy construction is perforce necessary and has its foundation in a deep and heavy bed of box pattern. One of the interesting features is the topping arrangement, which consists of cast steel carriers above the yokes on the threaded pillars. Both the yoke and carriers are carried on steel capston headed nuts, while the heavier yokes are supported also by ball bearings, contributing to easy and rapid adjustment. The tailstock is carried on eccentric roller bearings. It is so easily manipulated that it can even be pushed by hand when riding on the rollers. For convenience in ejecting the center from the tailstock mandrel, the screw operating the mandrel is so designed that by reversing the direction—that is, by running the mandrel back—the center is pushed out of its tapered bearing by the end of the screw.

### The Lapointe Double Drill.

A somewhat curious construction in a drill press will be observed in the one herewith illustrated, which combines a hand or power feed upright drill and a sensitive



A Combined Upright and Sensitive Drill Built by the Lapointe Machine Tool Company, Hudson, Mass.

drill on the same supporting column. The machine is built by the Lapointe Machine Company, Hudson, Mass., and between its two parts provides for drilling holes of all sizes up to 1 in. in diameter. With the various interchangeable attachments furnished with it it is remarkably convenient for a very wide range of general work. Both drill spindles are at the same distance from the center of the column, each allowing drilling to the center of a 14-in. circle; consequently the swinging tables can be used under either spindle, which is an advantage when

both large and small holes are to be drilled in the same piece. By swinging the table the work may be quickly brought under the opposite spindle, and in many cases the time lost in changing drills is saved. The driving arrangement allows either drill to be used independently or both to be operated simultaneously. The sensitive drill has a capacity up to  $\frac{3}{8}$ -in. holes.

The positive drill, the one at the left in the engraving, is bevel gear driven from the cone pulley shaft, and can be instantly connected or disconnected by means of a lever which slides the driving bevel pinion out of engagement with the bevel gear on the spindle. The spindle is carried by a sliding head and is provided with power feed, a lever feed and a quick return. There is an automatic stop for a feed knockout for drilling to a predetermined depth.

The sensitive drill on the right side is driven from a friction disk on the cone pulley shaft, contact with which is made by a roller which may be adjusted in its distance from the center of the disk to alter the spindle speeds according to the size of drill used. An interesting feature is the arrangement for feeding the work to the drill by the use of the knees, the operator being seated at the time on the adjustable seat, which in the engraving is shown on the heavier drill side. The bracket supporting it can be swung so that it may be used by an operator on either side of the drill. When used on the sensitive drill side the operator sits with his knees beneath the cross bar on the lower end of the shank of the upper drill table, and by upward pressure exerted through his knees he can accomplish the feeding, with both hands free for holding the work. An adjustable stop is provided for the table, consisting of a screw with lock nuts to limit the height to which the table may be raised and so regulate the depth of hole drilled. When desired the feeding can be done in the usual way, the table being stationary and the spindle brought down to the work by means of the hand lever shown. When the driven disk on the spindle is raised to its upper position by means of the sliding rod and knob handle shown, the contact with the driving disk is broken as the disk is recessed near its center and the drill stops, while the driving pulley continues to run.

All of the work tables and fixtures shown on the base can be used with either spindle. The 13-in. square table on the left of the engraving can be swiveled for drilling holes to any angle in a piece of work. The lower round table shown under the sensitive drill spindle does not swing about the column, but is secured to a dovetailed slide. It may be transferred, however, to the slide on the opposite side of the column if it should be desired to use it under the larger drill. The trough block, cups and point centers shown near the base may be used inserted, as the first is shown in a bracket provided on the base vertically under either spindle, or in the bracket holding the lower work table at the right when this table is removed. It is thus possible to handle various lengths of stock in a vertical position.

### New Loss or Damage Rule by Western Railroads.

The Western railroads have abandoned their efforts to make the shipper assume the risk of loss or damage in transit. The Western Classification Committee has adopted a new rule, effective July 15, in place of the objectionable Rule 4, the amended rule reading as follows:

Ratings made in this classification are for shipments made subject to the following conditions: No carrier or party in possession of any of the property provided for in this classification shall be liable for any loss thereof, or damage thereto, from causes beyond its control.

In this new version of the rule the carriers accept their common law liability. The old rule, if enforced, would have made the shipper bear practically all losses excepting those due to wrecks or a total failure to deliver. An article in *The Iron Age* of March 12 called attention forcibly to the dangers in these rules of the various classifications. Important shipping interests then took the matter up with the Western roads and succeeded in getting several important lines to abandon the old rule, after which the Western Classification Committee adopted the new rule above quoted.

It is understood that the Transcontinental roads also have under favorable consideration the abandonment of the loss and damage condition which they inserted in their tariffs to and from the Pacific Coast last winter. An article in *The Iron Age* of December 19, 1907, gave the shippers of the country advance information regarding this move of the Transcontinental lines, which was the first attempt of any important roads to limit their liability by a rule incorporated directly in a tariff.

R. L. A.

The Detroit Foundrymen's Association, after a dinner tendered to Dr. Richard Moldenke, secretary of the American Foundrymen's Association, on June 1, listened to an address by him on "Malleable Cast Iron." The

## Foundry Sand Conveying.

The need of mechanical conveyors for distributing sand in foundries is emphasized where moulding machines are in use, because the advantage of the machines depends largely upon the sand supply. Two types of apparatus stand out prominently in this work—the belt conveyor and the reciprocating conveyor. The former well fits the conditions when the sand is to be carried on straight or slightly inclined runs for a single discharge over the end of the conveyor; but if arranged for a number of deliveries, or for a single delivery at any point other than over the end, a tripper, usually cumbersome and heavy, is necessary, and the reversing pulley of this tripper subjects the belt to excessive wear both by the

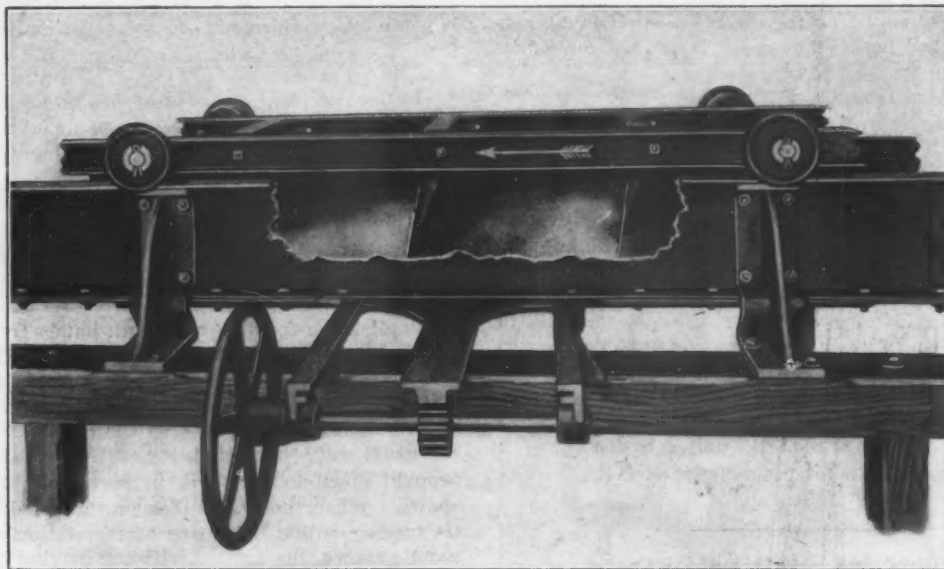


Fig. 1.—The Link-Belt Reciprocating Conveyor with the Flights Pushing the Sand Forward.

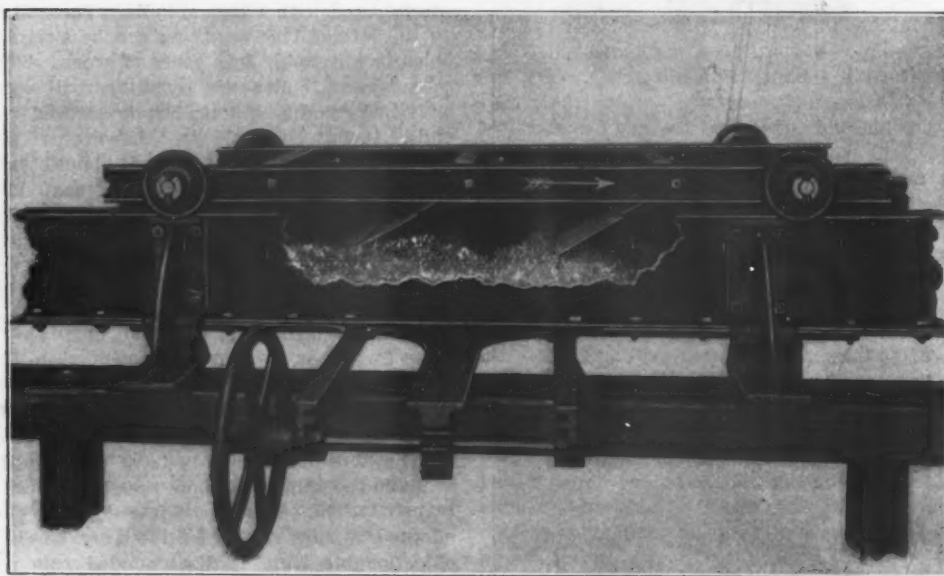


Fig. 2.—The Reciprocating Feeder on Its Return Stroke, with the Flights Feathering Back Over the Sand.

Detroit foundrymen have a booth and headquarters at the Toronto convention this week, which is attended by a large delegation from Detroit. The organization at Detroit has been growing rapidly, and it is expected the membership will soon reach 100.

The British Government recently announced that the steamers *Lusitania* and *Mauretania* had fulfilled all the conditions in the agreement whereby it was understood that if the two steamers made the two transatlantic trips at an average speed of  $24\frac{1}{2}$  knots for the round trip they would receive the subsidy of \$750,000 per year.

added strain imposed and the continual grinding in of sand. A conveyor of the reciprocating type, however, is easily adapted for delivering at several points. The illustrations, Figs. 1 and 2, show the details of such a conveyor, which consists of a trough for holding the material, surrounded by a steel frame on wheels, which carries hinged flights extending down into the trough. Reciprocating motion is given to the frame and flights by a crank mechanism. When moving forward the hinged flights push the material along, as in Fig. 1, while in the reverse movement back to the starting point, they drag over the top of it as in Fig. 2. A noteworthy feature is that the working parts—which are few—are entirely away



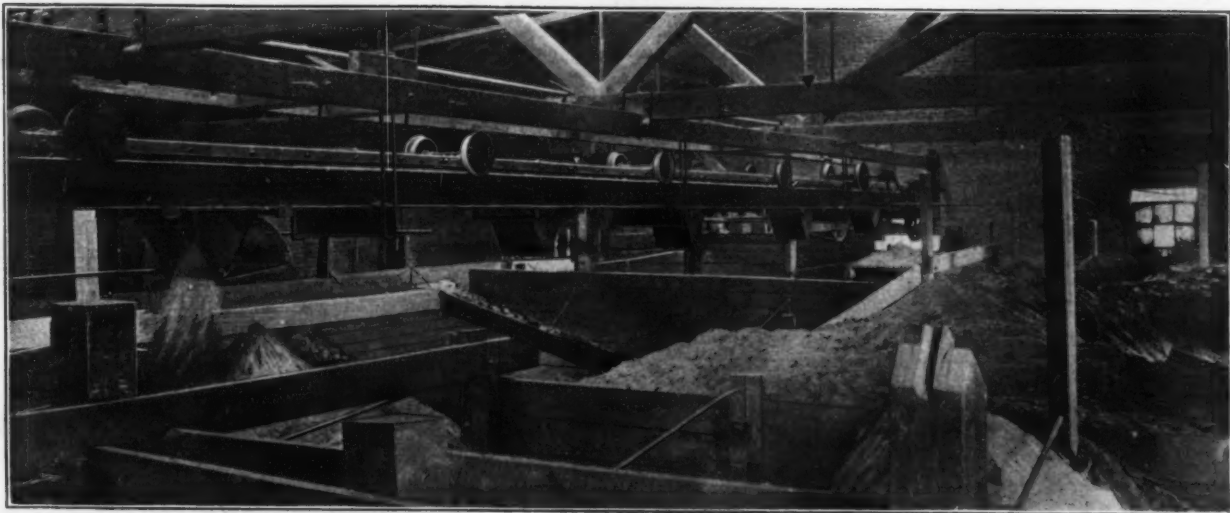


Fig. 3.—Sand Conveying Equipment Installed in the Atha Steel Casting Company's Foundry by the Link-Belt Company.

from the material handled; consequently they are less subject to wear and the cost of maintenance is reduced.

Fig. 3 illustrates an installation of sand-handling machinery at the foundry of the Atha Steel Casting Company, Newark, N. J., furnished by the Philadelphia branch of the Link-Belt Company. A Link-Belt elevator, outside of the building, receives sand from cars and feeds it at the rate of 37 tons an hour to the reciprocating conveyor shown, and this carries it to the bins, delivery being controlled by gates of special design, which are opened or closed by a hand wheel, as indicated in Figs. 1 and 2.

In many foundries reciprocating conveyors are installed under the floor, for removing sand from the room where the moulds are broken up.

### Annealing Steel Castings.\*

BY W. M. CARR, NEW YORK.

Annealing methods in the foundry industry are recognized as established practices. No one will deny that in the malleable foundry annealing is a very important step. Whatever differences of opinion there may be hinge rather on methods. In the manufacture of chilled castiron car wheels also no dispute exists regarding their treatment in annealing pits. They would never be shipped or put into service without such treatment. The value of the treatment is fully recognized and it receives as much attention and care as any step in car wheel manufacture. In the production of gray iron castings annealing is sometimes followed, with a view to lessening certain stresses or strains set up in the cooling of the castings from the pouring temperature. The influence of the process in the case of gray iron upon the formation of the carbon compounds is not so important. If, however, changes should occur they would be in the direction of softening the surface of the castings.

In the three branches of the foundry industry just cited annealing is employed in the first instance primarily to change the formation of the carbon compounds from a hard, glasslike carbide of iron to the temper carbon, a substance not unlike graphite in its characteristics, conferring softness and malleability by certain methods of heat treatment upon a previously hard, brittle substance. In the second case, annealing lessens intense cooling strains in the plate and other parts of the wheel but does not so affect the carbon compounds as to damage the depth and hardness of the chilled tread, throat and flange. In the third instance annealing concerns mainly the avoidance of cooling strains.

Coming to the steel casting industry, the practice of annealing is open to some doubt. When specifications so demand, steel castings are put through an annealing furnace, frequently without any consideration of the conditions of time and temperature. In the absence of an-

nealing specifications, steel castings are frequently shipped without such treatment.

Here we have the paradox of pains taken in the selection of raw materials, watchful manipulation of the melting and refining process in converting pigiron and steel scrap of proper quality into steel, pouring it into molds of particularly refractory sand, stripping and cleaning, followed by rigid inspection for flaws and imperfections outwardly visible, and finally shipping to the customer without annealing, delivering the castings with unknown stresses present, a coarse internal structure and other variables more or less liable to vitiate the value of the castings in service. If a casting shipped under such conditions should fail in service, all the precautions thrown around the methods of treating the raw material entering into it are wasted. The casting may be smooth, solid, true to pattern, of the proper chemical composition and the test bars examined from the same heat of steel may meet standard specifications in tensile strength, etc. Still, with all apparent evidences in its favor, if it is not annealed before going into service there will always remain a doubt as to the life of usefulness. The casting may fail unexpectedly. I do not mean to say that annealing will make the casting infallible, but I do know with other conditions being equal an annealed casting is less liable to fail in service than one not annealed.

In annealing steel castings we have conditions that are not entirely comparable with conditions existing in other branches of the foundry industry where annealing is more or less essential. The operation is not concerned with the changes in the carbon compounds. That is to say, the same carbide of iron will be present both before and after the treatment. In the matter of internal structures there are mainly two components; first, the crystalline formation and its refinement resulting from proper thermal treatment, and secondly the removal or lessening of internal stresses set up in cooling down from the casting temperature. It is peculiar to most metals that they should crystallize when cooling from a temperature at which they are cast, and the size of the crystals varies with the temperature and rate of cooling. The size and formation of the crystals have a decided influence upon the physical properties of the castings. Upon reheating metals to what is known as a refining or annealing temperature the grain or crystals of the metal will become smaller than their original form and with the change in structure will come better conditions physically. The castings will be tougher and better fitted to accomplish the work for which they may be designed. The refining temperatures are not the same for all metals, but generally speaking a suitable temperature to grain refined cast steels is about 825 to 850 deg. C.

There are, however, practical considerations to take into account that cannot be determined entirely by laboratory tests, such as the length of time to anneal a casting of a given shape and size, the style and type of furnace best suited to certain requirements. These points are capable of determination in view of the character of the product and the probable tonnage.

\* A paper read at the Toronto meeting of the American Foundrymen's Association, June, 1908.



## New Weinland Boiler Tube Cleaners.

Two new additions to the line of Weinland boiler tube cleaners, manufactured by the Lagonda Mfg. Company, Springfield, Ohio, are shown in the accompanying engravings. Fig. 1 illustrates the new Weinland four-arm, wing head turbine machine, and Fig. 2 the cleaning head of the steam or air driven cleaner.

The wing head is used on all of the company's turbine cleaners and is claimed to work fast on any scale, to have good wearing qualities and to be strong and

The rear arms carry only star cutters. All these cutters revolve freely on their pins and each pair cuts in a different path from the other, thus removing every particle of scale. As the cleaner revolves in a clockwise direction in the tube centrifugal force throws the cutter wheels against the scale forcibly, yet yieldingly, so that the tubes themselves are not injured. The four-arm wing head is used for 3½ and 4 in. tubes and is the largest size. Other types of heads are manufactured for various sizes of tubes. The cleaner is driven by direct connection to a small water turbine. The latter is made in two forms, one with ball bearing and one with

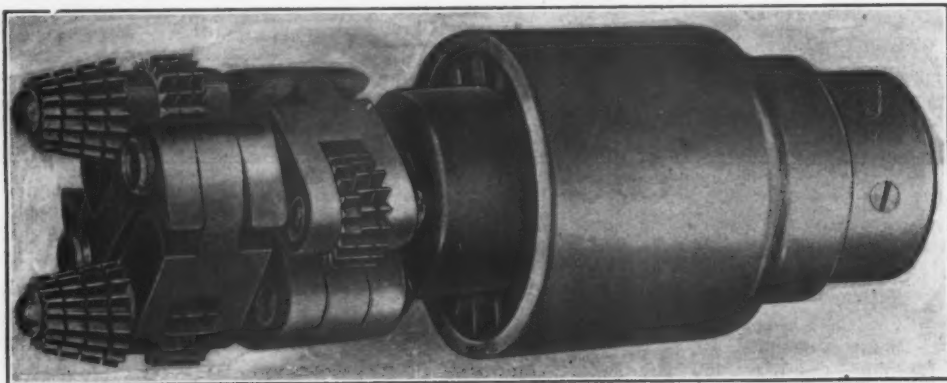


Fig. 1.—The New Weinland Wing Arm Turbine Tube Cleaner Made by the Lagonda Mfg. Company, Springfield, Ohio.

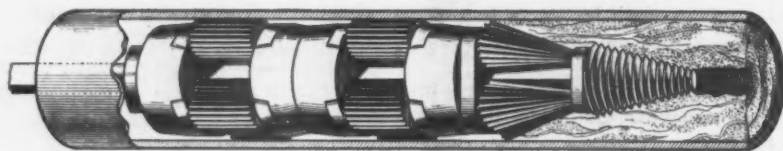


Fig. 2.—The Weinland Mechanical Cleaner.

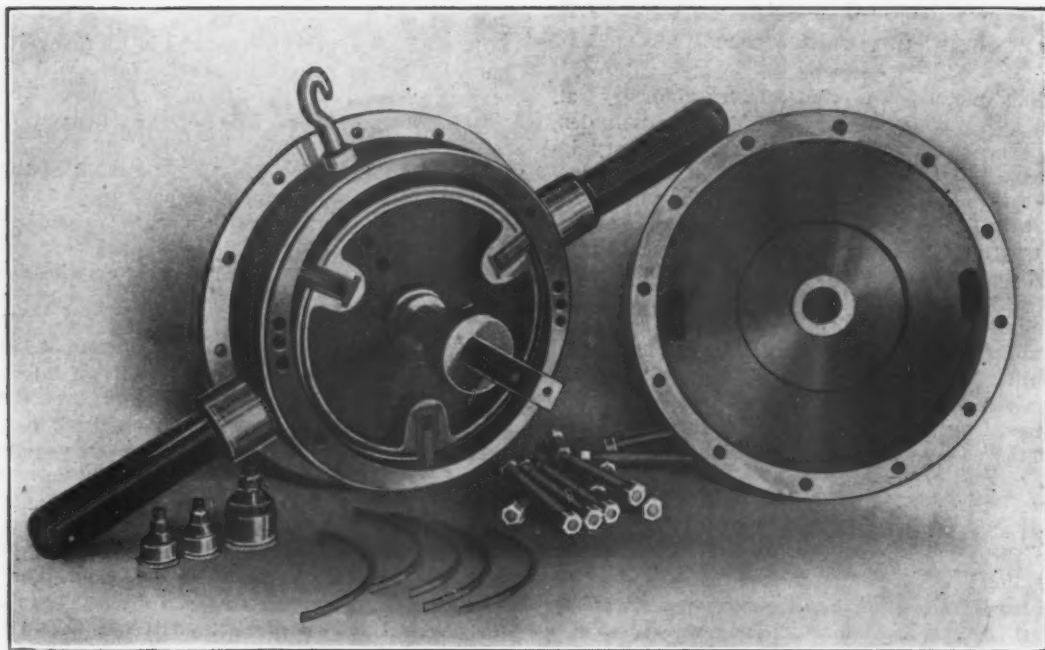


Fig. 3.—The Steam or Air Motor for Driving the Weinland Mechanical Cleaner.

capable of withstanding strain and severe jolts. It has few parts, namely, a spider, swinging arms and cutter wheels. The spider is steel and is milled from the solid bar, and the arms are drop forged. They are hinged securely to slotted arms of the spider, are free to swing by centrifugal force to the full diameter of the tube being cleaned, and are slotted at one end, which furnishes substantial support for the cutter wheels. There are four of these arms all alike, one pair preceding the other, each interchangeable. The cutter wheels are of both the star and solid steel cone pattern, and are carried on steel pins. The forward pair of arms each carry one cone cutter in front and three star cutters following.

A special thrust bearing. A special hose-coupling is used in connection with the cleaners, and water under 150 lb. pressure or more if convenient is recommended for operating.

The illustration of the cleaning head of the Weinland steam or air driven cleaner, Fig. 2, shows its method of action upon scale. It consists of a screw point which first bores into the lime, which is followed by a series of cone cutters arranged at an angle. These cut away the remaining scale and two sets of cylinder cutters follow, which remove any remaining particles and polish the tube. The machine consists of a jointed steel shaft with the cleaning head on one end and a rotary engine

on the other. For supporting it a trolley is used, consisting of a rope-operated differential pulley block and an overhead pipe, on which it rolls across the boiler front to align to each vertical row of tubes. None of the weight of the motor is supported by the operator, and the two handles are merely for guiding the machine and pushing it against the scale.

The interior of the motor is exposed in Fig. 3. The steam or air pressure enters through a hose connected on the rear side of the case, and operates against three radial paddles or pistons, thus compelling the rotor to revolve at a speed determined by the pressure of the steam and the forward thrust against the scale. The pistons are forced outward to a steam tight fit with the case by the admission of pressure at the back end of the cages in which they slide. The admission ports, the three holes near the handles, admit steam or air to the space between the rotor and case. Each piston is under full steam or air pressure until the rotor has made a quarter turn, and, as there are three pistons, the rotative effort is practically continuous. The important bearing surfaces and cages in which the pistons slide are hard bronze and wear is further minimized by lubri-

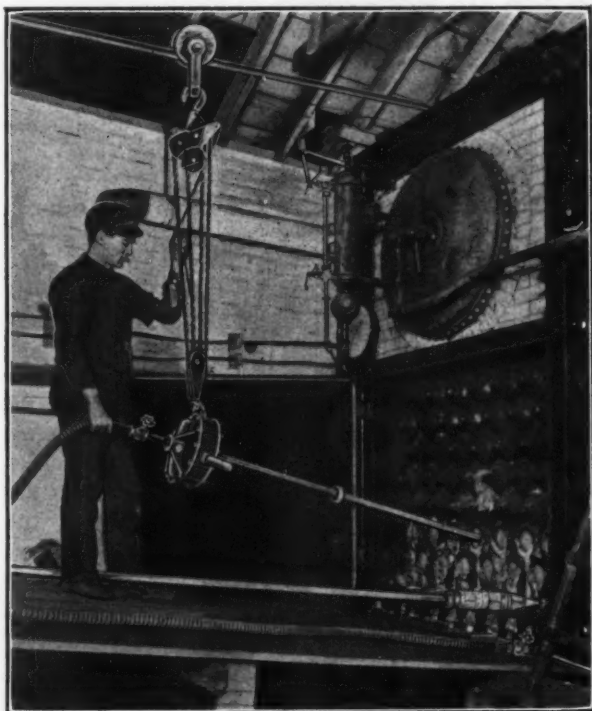


Fig. 4.—The Weinland Mechanical Cleaner at Work in the Foos Mfg. Company's Boiler Plant.

cators on both the front and rear of the case which force oil to the bearings. From 5 to 7 hp. may be brought to bear upon the scale and by throttling the steam the torque of the shaft and the speed of the cutting head may be adapted to any hardness or thickness of scale. At slow speeds and under heavy torque, the cleaner head is claimed not to become stalled in the worst scale.

Fig. 4 shows this cleaner under test of both steam and air pressure at 75 lb. in the plant of the Foos Mfg. Company, Springfield, Ohio. As this plant was too busy to shut down its boilers, scale had accumulated until it was  $\frac{3}{8}$  to  $\frac{1}{2}$  in. thick and very hard. The cleaner, using steam as motive power, was started at 9 o'clock one night and by 6.30 the next morning 49 tubes had been cleaned. Many of the tubes were cleaned in from 4 to 5 min. each. Equally good results were obtained on a similar boiler in the same plant with compressed air. At the Pittsburgh Plate Glass Company's works at Crystal City, Mo., scale which almost filled the tubes of Green fuel economizers was removed. The scale in this instance was as hard as rock, and although three men at times placed their whole weight on the motor the cleaning head bored its way through without stopping.

## Customs Decisions.

### The Steel Wool Case.

The Government and the domestic manufacturers of steel wool received a setback Friday when the Supreme Court of the United States declined formally to issue a writ of certiorari, which would have had the effect of reviewing a recent decision of the Federal Circuit Court of Appeals.

Henry M. Hoyt, solicitor-general of the United States, and his assistant, Edward T. Sanford, asked the court of last resort to grant a writ, while Albert H. Washburn of the law firm of Comstock & Washburn of this city, opposed the consideration of the case by the court on the ground that the finding of the tribunal below was equitable and should not be disturbed. The refusal of the court to take up the case is believed to be based on the arguments advanced by Mr. Washburn in his brief filed with the court.

Unless the Government can find a way to bring what is known as a new case the decision of the Court of Appeals will stand. This decision found steel wool used in polishing furniture and floors dutiable under paragraph 137 as a manufacture from steel wire at a rate of duty depending upon the gauge and value of such wire. The contention of the Government was that the product is dutiable under the metal schedule at 45 per cent. ad valorem. The question of classification under the tariff has been in litigation since 1902.

### Miners' Diamonds.

The question of the classification of so-called miners' diamonds was the subject of a decision by the Board of United States General Appraisers handed down on Monday. The case came before the customs tribunal through the medium of a protest filed by the Sullivan Machinery Company, New York, objecting to the 10 per cent. duty assessed under the provision in the law for "diamonds and other precious stones advanced in condition, but not set." Instead, the importer alleged that free entry should be accorded in harmony with paragraph 545 specifying "miners' diamonds not set." General Appraiser Sharretts, who writes the decision for the board, states that nowhere in the record is it shown that the stones in suit are commercially known as miners' diamonds. Carbonado, or black diamonds, which are used chiefly in the construction of drills for mining and prospective purposes, are, in the opinion of the board, the articles embraced within the term "miners' diamonds." At the same time, however, the board is unwilling to accept the claim of the importer that, irrespective of whether the diamonds have been advanced in value, they are exempt from duty. On this point the decision overruling the protest says in part:

It is shown that the process of breaking or cutting miners' diamonds involves a loss in waste of from 15 to 30 per cent. besides the cost of cutting; hence it follows that the stones in question have been increased in value to a corresponding degree. We accordingly find as facts that the articles in dispute are miners' diamonds, not bort, and that they have been advanced in condition or value from their original condition by cleaving, splitting, cutting or any other process. We hold that they are excluded from free entry as precious stones in their natural state.

Announcement is made by the Standard Roller Bearing Company, Philadelphia, of the installation at its factory of a thoroughly equipped testing laboratory, in charge of Walter H. Hart, an expert chemist formerly connected with the Alan Wood Iron & Steel Company.

The Burt Mfg. Company, Akron, Ohio, has received an order for 10 of the company's glass top or combination skylights and ventilators for shipment to Canton, China, and has recently made shipments to Valparaiso, Chile; city of Mexico and Barcelona, Spain.

Reports from Coshocton, Ohio, state that plans have about been completed for the large cast iron pipe plant to be erected in that place by James B. Clow & Sons, Chicago, and that bids will soon be received for the buildings.



# THE IRON AGE

Established in 1855.

New York, Thursday, June 11, 1908.

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					FOREMAN EDITOR.

## Southern and Northern Merchant Pig Iron.

Attention has been called from time to time in the market reports of the past few months to the relatively larger sales of Southern than of Northern foundry pig iron. The reason is well known. The price maintenance policy apparently had more active and consistent adherents among pig iron makers in the East than in other sections, and Eastern buyers of pig iron found Southern offers more attractive. A pig iron merchant refers to the matter as it is suggested by our own pig iron statistics for June 1, in the following letter to *The Iron Age*:

I am very much interested in the figures you give in the issue of June 4 concerning the pig iron output for May. I carefully note the total production of the South, including Maryland, Virginia and Kentucky. This production, together with that of Alabama, Georgia and Tennessee, presumably includes the entire output of those districts, including the pig iron made by the Tennessee Coal, Iron & Railroad Company and the Maryland Steel Company. I also note that about this time a year ago we were very close to the maximum tonnage in pig iron output. Would it be possible for you to submit the merchant production in the South and give a comparison of the production of May, 1908, with that of 1907? I believe that it would show how extremely small the present merchant demand is and also the probable capacity of the Southern merchant furnaces under favorable conditions.

It is altogether probable that a much larger percentage of the merchant furnaces of the South are now employed than of those of the North and West, and I believe that the reserve capacity in Southern districts is relatively unimportant; therefore, should a demand set in which is greater than those districts can supply, manifestly the excess must be furnished by furnaces in other districts, and therefore we might suppose that better prices would be established immediately after such increased demand. I believe a mere statement of facts concerning Southern capacity now employed and that employed one year ago, would be most interesting to the trade.

The Southern merchant furnaces producing coke iron are those of Virginia, Kentucky, Tennessee, Georgia, Alabama and Texas. The Maryland coke iron product enters into steel, largely for export. West Virginia produces only steel making iron, and its raw materials and markets are Northern. The comparison asked for, therefore, would be between the merchant pig iron output of the six states named in May, 1907, and that of May, 1908. This eliminates from the account the production of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Company, which goes to the adjoining steel works, as well as that of the Southern Steel Company which was largely consumed at the latter company's steel plant at Gadsden, Ala. Our correspondent is correct in saying that in May, 1907, we were very close to our maximum pig iron output. May of last year showed a total output of 2,294,005 gross tons of coke and anthracite pig iron, and that month was only exceeded by the banner month of October, also a 31-day month, which showed a total

of 2,336,972 tons. The total merchant furnace production and that of the South compare as follows for the two May periods, in gross tons:

	Total merchant pig iron.	Southern merchant pig iron.	Per cent. of Southern.
May, 1907.....	779,777	197,736	25+
May, 1908.....	404,323	134,195	33

It appears that the Southern furnaces produced one-fourth of the merchant pig iron in May, 1907, and one-third of the merchant pig iron in May, 1908. Some increase in Southern merchant furnace capacity has been made in the past year, notably the new furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, Ala., and the new Vanderbilt furnace at Boyles, Ala. It is true, however, that the reserve merchant capacity in the South is unimportant, reckoned by the consumption of last year or even that of an average year, but in a time like the present a possible increase of more than 50 per cent. upon the present production of Southern merchant furnaces is a factor of no small importance. To be sure there is no such possibility to be reckoned with on any such price basis as that of to-day, but the outstanding fact is that on the low level lately prevailing the Southern merchant furnaces have persisted in taking a considerably larger percentage of the total business than they were securing a year ago.

## Industrial Schools and the Small Towns.

A law just enacted providing State aid for free industrial schools in Massachusetts establishes the right of a resident of any city or town in the State to attend an industrial school located in any other community and compels his residential city or town to pay his tuition fee. This wholly logical provision is designed to meet the wants of the young people of places so small as to be unable to support schools of this character. It is intended as a factor in the plan of dividing the State into districts, each with its industrial school supported in part by the State. With the fulfilment of the plan the new law should go far towards solving the problem of industrial training in communities the children of which would otherwise be without its advantages. It is a just provision, for it would be manifestly unfair to use public money in extending privileges to residents of places important enough to bear part of the expense themselves, to the exclusion of those living elsewhere in the State. The only objectors, doubtless, will be towns so small and so poor as to grudge the tuition fees of their children.

The principle of State aid for schools of this character is an excellent one. Their benefits are far from local to the places where they are situated. The students go out into the world to use the results of their training wherever it will reap them the most benefit. Not a few of the graduates enter the engineering schools and advance to higher work, which is generally more profitable to themselves and to the State and the country as well. Another important element in State aid lies in the encouragement which it gives to industrial education as a whole, helping to establish it as an accepted part of the school curriculum of every center of population, whether that center shall be a place of large size or a central point in a district from which the students will be recruited. In other words, the participation of the State gives impetus to a great movement the need of which is now being accepted generally as an essential part of the foundation of the country's future industrial welfare.

The idea seems to be strongly implanted that the industrial school proper should be developed to a point of complete efficiency and accessibility to students before



the attempt is made to establish the so-called industrial colleges, referred to editorially in *The Iron Age* of April 2. The legislative bill in Massachusetts providing for the creation of a commission to investigate the subject has been vetoed by Acting Governor Draper, himself one of the heads of the Draper Machine Works, Hopedale, manufacture of textile machinery and a large employer. In his veto message he voices what seems to be a general opinion among manufacturers when he states: "I do not think it is time for the Commonwealth to consider the erection of one or more of these colleges providing for a three or four years' course of extended training, before any industrial schools of similar character have been organized or started." In other words, the schools are considered the basis of the system of education. Once established, the industrial college, occupying an intermediate position between the industrial school and the polytechnic or engineering schools, would be a natural development of the system. Probably the idea is a correct one, that it is better to concentrate energies on the one branch of industrial education until it is perfected and established to cover the entire territory. The college would be an evolution from the school, and doubtless would be the better because of the experience gained in the interim before its actual foundation.

The movement for this general branch of training is so strong, its acceptance has become so general, closing to a marked degree the old controversy between exponents of manual training and trade schools, combining in a sense the best ideas of each, that at no distant day the industrial schools of the United States will become as well recognized as an essential part of the general educational system as the high school, college and polytechnic institution of to-day. Abroad the test has already been made, especially in Germany. We believe that few persons doubt the great direct benefits which have accrued to that country from this source.

### The Lesson of the Fall River Wages Agreement.

The practical operation of the agreement between the cotton manufacturers of Fall River, Mass., and the Textile Council, the union of their employees, has demonstrated that where both sides to such a contract live up to the automatic adjustment of wages based on market conditions, the system works out with excellent results. In this case the wages are based on the average margin for the previous six months. When the agreement was reached as the result of the work of a commission appointed by the Governor of the State, there was a slight increase in wages, though not near the percentage for which the union was fighting by a protracted and costly strike. Later on the agreement automatically produced an advance in wages corresponding with the market. Now it has effected a decrease of nearly 18 per cent., which has been accepted by the employees of the great mills, numbering many thousands. No friction was created. The manufacturers granted advances when they were due, and the employees took the decrease without a murmur. It was no important element in the acquiescence of the latter that they have confidence that, as times improve and the foundation of wages becomes more favorable, conditions will again adjust themselves, always on a basis of equity to all concerned.

In most lines of manufacturing such an arrangement would be hardly feasible, it is claimed, owing to a lack of uniformity of conditions of labor and prices of material. It is only with the great staples that an automatic adjustment of this character can be made. No one can doubt that in order to produce results under the system

the union of employees must conduct itself according to strictly business methods, with full regard for the rights of property represented in the capital invested to employ them. That a cut in wages of 18 per cent. was accepted without a protest proves that the textile workers have lived up to this principle. The Fall River agreement is an example of the possibilities of the relations of employers and employees, where the latter are willing to let existing conditions govern their welfare.

### The Railroads' Opportunity.

It is to be hoped that the example of the Erie Railroad in placing its repair shops in full operation will be followed by other roads. On most of the large systems, and practically all of the small ones, motives of immediate economy forbade all expenditures for shop work excepting where repairs were imperatively needed. The policy may have been unavoidable under conditions of the money market, as they existed last fall and winter. But now, with radical changes in sentiment, as indicated by the ease with which railroad bonds are being marketed, there should be no reason why in most cases the policy of the Erie should not be followed out. Rolling stock depreciates very rapidly under the methods that have been in practice lately. Procrastination in the making of repairs is always expensive. The best preparation for an era of protracted heavy traffic is to put every locomotive and car in first class condition.

During the period of congested freights there was no time for more than superficial repairs if they could be made to suffice. Everything that could run was kept in constant service. With the sudden, serious falling off of railroad business, resulting in a large percentage of rolling stock standing idle, it became necessary to avoid the expenditure of every cent beyond actual necessary expenses. Consequently equipment is in little better shape than a year ago; in some cases it is in much worse condition. The natural business method would be to take advantage of the first possible moment when finances will permit and begin the rehabilitation of equipment. Otherwise the next serious strain upon railroad resources will mean so very rapid a deterioration that locomotives and cars which would have had years of usefulness will have to go to the scrap heap before their time, or be retired for repairs so comprehensive as to amount to rebuilding, which will mean high cost and protracted delay. Those in active charge of railroad operations are of this opinion and are looking to those who have the financial direction of affairs to take the same view of the situation. If they do, there will be a quick return of busy times in repair shops all over the country, with a wholesome effect upon the general market.

### Blast Furnace Gas Engines Develop a Problem in Germany.

Our Berlin correspondent, whose report upon the condition of the iron trade in Germany will be found in another part of this issue, mentions a fact which is of much interest in connection with the use of blast furnace gas in gas engines. He points out that the rate of pig iron production in Germany has been kept at its high point for a considerable time after the flood tide of prosperity in the iron trade had passed. The explanation, he says, is to be found largely in the use of furnace gas in gas engines. As the gas was needed for creating power the furnaces were in many cases kept running without respect to the actual demand for iron. The consequence is that considerable stocks have been accumulated at the

furnaces, much beyond the immediate demands of the market.

This is a point which has not been overlooked in the discussions of the production of power for other purposes from the operation of combustion engines on blast furnace gas. Up to this time, however, it had simply been a theory that such a condition of affairs might develop. Here we have the actual realization of the contingency. It naturally brings up the question of the effect on the pig iron trade of anything like a widespread practice of utilizing blast furnace gas in the development of power to operate other portions of an iron and steel plant, or for near-by collieries or general power purposes. If another plant, which must be kept running, depends entirely or even largely on the power obtained in this way there is no escape in a time of depression in the iron trade from the burdensome accumulation of stocks of pig iron.

The experience in Germany suggests that the reserve gas producer plant, fed with bituminous coal, which has been regarded desirable as supplementary to a blast furnace group, where large power requirements are supplied by the latter, would need to be increased beyond what has been generally contemplated. It is to a large extent a case of balancing the benefits of a close regulation of pig iron output, in times of reaction, against an investment in gas producers that much of the time would lie idle.

### The Mesaba Range Labor Situation.

DULUTH, MINN., June 6, 1908.—That not all the bitterness rising out of the organization of many miners into a branch of the Western Federation, and its strike last year, is over has been evidenced from time to time by sporadic outbreaks of the fever for destruction. A mine captain's dwelling has been blown up, fires have been set about properties, attempts have been made to injure development and exploratory work, machinery has been destroyed and air pipe lines have been broken by dynamite charges. Doubtless many more acts of a like or worse nature would have been committed before this but for the care exercised by the mining companies and the watch they have maintained at their properties all over the Mesaba District.

#### Lawlessness on the Ranges

is something that must be expected, for a considerable time to come, at any rate. The class of work done, particularly on the Mesaba, the consequent character of the population, the examples set these men by a large portion of those with whom they come in contact, all tend toward a condition that makes lawlessness certain. Manual labor on the Mesaba Range is simply muscle, not brains; little initiative or thought or brains is necessary for the workman who is in a steam shovel gang on a stripping pit or dump and who spends his time in the least skilled of employments. The men are foreigners, chiefly from eastern Europe. Probably nowhere in the United States are the Balkan countries so represented among the laborers. Montenegrins, Servians, &c., Hungarians, Austrians, South of Italy men, Russians, Fins and Swede-Fins make up the bulk of unskilled labor. Some of these people speak English, but many do not. Ignorant, and not understanding what is said, they are suspicious; accustomed only to government by repression and fear, they are likely to misconstrue any attempt on the part of a mine management to deal fairly with them, considering it as evidence of weakness and to be met by boldness and abandon on their own part. Convinced by the specious argument of some labor agitator that they are wronged, they will be proof against reason and judgment, for they have neither, and will be like the dry grass of early spring when a match is set to it.

#### The Character of the Men.

Notwithstanding the pleas of professional philanthropists, who protest against considering these men as mere

adjuncts of machinery, any other method of treatment is impossible. Steve Donjonovich may be employed at one contract to-day; to-morrow he will be Kalas Paripovich at another location, and in a week will be back at his first job under the name of Marks Yiljari. Nothing but a system of numbers can keep track of such a man as this. He has no home, no friends, no morals, no desires but to satisfy his appetite for food, drink, &c. He receives no letters, and has as far as can be learned, no tender memories of home nor ties of childhood. He drinks beer in such quantities occasionally as to become more of a beast than usual, during which time he and his male and female associates carry on orgies the lubricity of which is such as to stun a man of ordinary moral sense. His home is a shelf in a boarding house whose keeper is an illicit dealer in liquor. He carries a long and murderous knife, and the stabbing and cutting affrays that occasionally result fatally are looked upon as mere diversions for Sundays and holidays, and as scarcely worth arrest, much less indictment by the grand juries. He lives on a plane so low as to remind the onlooker of beasts; his food is of the coarsest and is not especially nutritious. On this account beer, containing a certain proportion of alcohol, hops and barley, is perhaps necessary as a food adjunct, and is consumed in great quantities.

#### Beer is Necessary.

So well understood is this demand for liquor as food that, during the strike of miners last year, the companies were compelled to recognize it. The sheriff had closed all saloons and prohibited the importation of beer by brewers. Men could not then be secured for mine operation until it had been promised by employers that beer should be delivered to the locations guarded by the deputies. Recently a delegation of citizens of one Mesaba town, alarmed at the increasing degeneracy of children, the obscene and ribald exhibitions on their streets, and the disregard of all laws of property and private rights by men in drink, protested to brewers against the unlimited sale of beer illegally in their town. The committee recognized, it said, the apparent need of liquor as food, brought about by the character of the sustenance of the workmen, but it did think that the breweries might arrange matters so that there should not be above one gallon per man per day supplied, in addition to what might be bought at saloons. The inference is that the illicit traffic alone in that town amounted to considerably more than "one gallon per man per day."

The disregard of law, thus shown, has its natural effect on these ignorant foreigners. They think that if men with whom they are brought into daily contact can thus break laws with impunity, why cannot they also break any they see fit? This has accounted for not a little of the spirit of anarchy that has pervaded the district for some time, and that at any moment might break out into unrestrained riot were it not for the strict repressive steps that were taken some time ago. There is probably no labor center in the United States where conditions are more complex and where the future must be viewed with more serious consideration by the student of political economy than on the Mesaba Range.

D. E. W.

The Gladstone Furnace of the Pioneer Iron Company, one of the important charcoal stacks in the Lake District, will soon be blown out for repairs and relining. It has been in constant operation for more than six years, and needs some changes. This is one of the Cleveland-Cliffs Company's subsidiary enterprises, and is equipped with very complete chemical works for the distillation of the wood products, &c.

Railroad interests are greatly exercised over their inability to comply with the terms of a bill passed by the Senate requiring all roads after a certain date to equip their locomotives with automatic ashpans. The bill was demanded by labor unions for the supposed benefit of locomotive firemen. It is declared emphatically by railroad men that no device of the kind required has yet been produced.



## The American Foundrymen's Association.

TORONTO, ONT., June 9, 1908.—(By Telegraph.)—The registration at the twelfth annual convention of the American Foundrymen's Association reached 975 this afternoon and is expected to be fully 1200 by to-morrow. Both in spirit and in the size of the representation of the important foundry centers of the United States it is up to the Philadelphia convention of last year, while the exhibits under the auspices of the Foundry Supply Association are the best yet shown.

Though Canadians are indifferent about commercial reciprocity with the United States, their foundrymen seem to be hearty believers in reciprocating the good fellowship they have found at previous conventions of the association. L. L. Anthes of the Toronto Foundry Company, Ltd., chairman of the General Committee, and Fred Somerville of Someville, Ltd.; Robert Cluff of the King Radiator Company, Ltd.; Peter McMichael of the Dominion Radiator Company, Ltd., and W. P. Near of the Page Hersey Company, Ltd., chairmen of the various local subcommittees, have put in weeks of hard work on the preparations, and the result is a meeting that in its social and educational features promises to make a new record.

The reception to-night to the delegates by the Mayor, City Council and other officials is a recognition such as these conventions have not previously had. Furthermore, the local papers give the convention generous attention, albeit some of their statements have a touch of humor, one article telling how at an exhibit building "a company is using iron that is molded in the cupola and is melting souvenir molds and castings."

Three buildings at the Canadian National Exhibition, which is about two miles from the business center of the city, are given up to the convention, two being filled with exhibits and the third devoted to the sessions for papers and business.

Stanley G. Flagg, Jr., president of the association, called the meeting to order Tuesday afternoon and introduced Mayor Oliver for the address of welcome. The Mayor exhibited the reigning Canadian spirit when he expressed the hope that some of the visiting foundrymen would start branch shops in Toronto. He also served notice that the piecemeal annexation of the people of the United States by Canada would go on. Responses to the welcome were made by President Flagg for the American Foundrymen's Association; President E. H. Mumford, Philadelphia, for the Foundry Supply Association; President Charles J. Caley, New Britain, Conn., for the American Brass Founders' Association, and President W. S. McQuilan, Warren, Pa., for the Associated Foundry Foremen.

Mr. Flagg then gave the presidential address, which referred to the Philadelphia meeting of last year as marking an epoch in the prominence it gave, just as is being done at the Toronto meeting, to the practice and actual operations of the foundry. The address discussed ably the province of such an association, and pointed out how the foundries of the United States owe an incalculable debt to the organization. The possibilities of a larger work of investigation given by the provision of sufficient funds were outlined, and an increase in the annual dues was suggested, so that the special fund for research work to which a number of members had contributed in the past year might be increased.

Secretary Moldenke read his report, showing among other things a present membership of 730, including 67 in Canada. The special fund for investigation collected in the year amounted to \$585, and in addition \$300 from Pittsburgh was raised by J. S. Seaman of that city. The effect of vanadium and titanium on cast iron had already been investigated, the secretary reported, and a scientific study of molding sands is well under way.

Adjournment was taken to Wednesday morning, when the Brass Founders' Association will hold a session for the reading of papers, while on Wednesday afternoon will come the first session of the American Foundrymen's Association for papers and discussions. A move-

ment is on foot for a closer federation of the four associations next year. This may require some change in the basis of organization.

## A Jones & Laughlin Employees' Banquet.

On Saturday, June 6, about 50 of the various department superintendents and foremen of the coke ovens and blast furnaces of the Jones & Laughlin Steel Company gathered together at a most enjoyable banquet for the purpose of promoting good fellowship and harmony among all the employees in these works of the company. The banquet was served in the Hotel Henry, Pittsburgh, and was enlivened by the Lindsey Crescent Quartette of negroes and by various toasts and speeches from the employees and guests, who were introduced by E. L. Messler, general superintendent of the coke oven and blast furnace departments, who acted as toastmaster.

Among the guests who responded were B. F. Jones, Jr., president of the company, on "Our Future"; W. L. Jones, vice-president and general manager, on "Our Past"; R. B. Drum, superintendent coal mines, on "The Black Diamonds"; M. J. Dowling, general superintendent steel works, "Those Furnace People"; W. H. Lewis, general superintendent Allquippa Works, "What Allquippa Is Going to Show the Pittsburgh Works"; G. M. Laughlin, Jr., general superintendent Soho Furnace, "The Plates That Were Always Wanted Yesterday."

Some of the employees who responded were as follows: P. H. Gilday, assistant general superintendent coke oven and furnace departments, "My Dream of the Future"; N. C. Neemes, superintendent coke ovens, "The Old Plant"; Wm. Smith, master mechanic, "The New Plant"; J. O. Willard, engineer furnace department, "Get Together."

## The Amalgamated Wage Scales Unsettled.

The conference between the Amalgamated Association and the Western Bar Iron Association at Cambridge Springs, Pa., last week, adjourned without a settlement being reached. The manufacturers asked for reductions in boiling and finishing scales averaging 10 per cent. or more, basing these on the recent lowering of prices on iron and steel bars. These reductions came at the time the conference was in session and were entirely unexpected. Settlement of the scales was then deferred to see whether there would be further reductions in prices on finished iron and steel. No arrangement has yet been made between the Amalgamated Association and the Republic Iron & Steel Company for a conference. A conciliation agreement exists between the Amalgamated Association and the Western Bar Iron Association by which the mills belonging to the latter may continue in operation after July 1, pending a final settlement of the scale, and pay the present rates of wages, but whether the manufacturers will agree to operate their mills after July 1 on present scale rates is doubtful.

The Northern Motor Car Company and the Wayne Automobile Company, Detroit, Mich., have been consolidated into a new company to be known as the Everitt-Metzger-Flanders Company, which will have a capital stock of \$1,000,000. The new company plans to build 12,500 motor cars next year, to be equipped with a 30 hp. four cylinder motor. The car will be called the Everitt and will be licensed by the Association of Licensed Automobile Manufacturers. The Board of Directors consists of Charles L. Palms, William T. Barbour, president of the Detroit Stove Works; Dr. J. B. Book, A. D. Bennett, B. F. Everitt, W. E. Flanders and William Metzger. B. F. Everitt, who is president, has been a large builder of automobile bodies, and W. E. Flanders was formerly manufacturing manager of the Ford Motor Company. William T. Barbour is vice-President, and Charles L. Palms, treasurer.

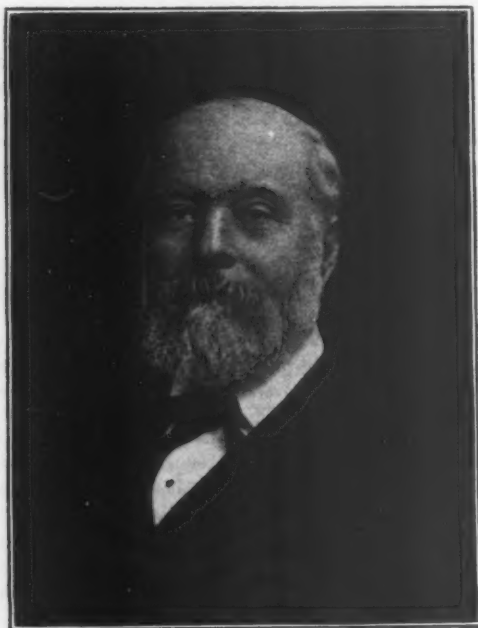


## OBITUARY.

PETER WHITE.

Peter White, probably the best known citizen of the Upper Peninsula of Michigan, died suddenly of heart disease at Detroit on Saturday morning, June 6. Born in Rome, N. Y., in 1831, Mr. White went as a boy to Green Bay, Wis. At 15 he set out in quest of the fortune which awaited him in the Northern Peninsula, then a wilderness, making his way to Mackinac, which had long been a trading post for the French Canadians. He lived on the island for several years, gaining much by contact with the Indians, traders, government officials and voyageurs. Mastering the dialects of the Indians and French, he made himself popular with all classes. For a time he attached himself to one of the schooners plying between Detroit and the Soo, and later he worked in a store in Detroit. Then followed two years in the lighthouse service.

In 1849 he set out for the Marquette country with a party of prospectors. At first he served an apprenticeship in a company store at Marquette, and the second winter he carried the mail on snowshoes and by dog train over 75 miles of wilderness to L'Anse, Mich. For this service



PETER WHITE.

with all its hazard he was promised \$1200, but actually received \$3. This experience was the subject of one of Mr. White's most entertaining stories, and here it may be said that as a raconteur he was known not only throughout Michigan, but in other States and many an important function, political and otherwise, has been made memorable to its attendants by Mr. White's rare gift of story telling. In 1851 he was elected to the joint offices of County Clerk and Registrar of Deeds at Marquette, and later treasurer of the local school board, a position he held for more than 50 years. In the early fifties he was appointed postmaster at Marquette and opened a general store. He was manager at Marquette for the Cleveland Iron Mining Company in its early days, and he acquired the land on which the main business portion of Marquette was built.

Late in the fifties he studied law and was admitted to the bar, being for 10 years senior member of the law firm of White & Maynard. In 1863 Mr. White incorporated what is now the First National Bank of Marquette. His business sense led him into a number of prosperous ventures, and for most of the past 40 years he has been identified with iron mining. At his death he was a director in the Cleveland Cliffs Iron Company and in the People's State Bank of Detroit. He was elected Mayor of Marquette some years ago, but declined the office. Several times he had been asked to accept political appointments, but did not care for such honors. He was a member of the Michigan Legislature in 1857 and was elected

State Senator in 1875, being a Democrat in politics. He was Michigan commissioner to the Chicago, Buffalo and Nashville expositions, and in recent years had been regent of Michigan University, member of the State Library Commission and member of the Mackinac Island Park Commission. He was the leading spirit in the semi-centennial celebration in 1905 of the opening of the Sault Ste. Marie Canal.

Marquette contains two enduring monuments to Mr. White. One is Presque Isle Park, comprising 389 acres, just north of the city. Through Mr. White's efforts a bill was passed at Washington ceding this park, which was government property, to the city of Marquette. Mr. White spent large sums in the improvement of this park. He gave the Peter White Library to Marquette and endowed it. In a book written by Ralph D. Williams, Cleveland, Ohio, under the title "The Honorable Peter White," the life story of Marquette's benefactor is told most attractively, and interwoven with it is what may be termed the romance of the iron ore trade of Lake Superior. Mrs. White died a number of years ago. There is one surviving child, Mrs. Shiras of Pittsburgh, wife of ex-Congressman George Shiras, a grandson of Justice George Shiras, retired, of the United States Supreme Court.

CHARLES AUGUSTUS LUNDELL, Boston, Mass., formerly prominently identified with the Swedish iron trade in that city, died June 1, aged 67 years. He was a native of Sweden, coming to America when a young man.

JULIUS G. WAGNER, Milwaukee, Wis., died May 31, aged 74 years. He had lived in Milwaukee since 1855 and was one of the pioneers of the city in the manufacture of iron and steel. He was the founder of the J. G. Wagner Company, which a few years ago became a part of the American Bridge Company. He leaves a son and two daughters.

SIR ROBERT G. REID, builder of one of the early bridges over the Niagara River at Niagara Falls, and the Lachine Bridge across the St. Lawrence River, died at Montreal, Canada, June 3. He was a native of Scotland, coming to America in 1871, after several years of Australian experience in mining and the construction of public works. Embarking in railroad construction and bridge building, he attained fame and wealth. For years he was in almost absolute control of the affairs of Newfoundland.

CALEB B. WICK, Youngstown, Ohio, one of the best known financiers and business men of the Mahoning Valley, died June 3, aged 72 years. He had been ill for a long period. He was born in Youngstown, and attended the local public schools until he was 17 years old, when he began his long and successful business career by accepting a position as clerk in the old Mahoning County Bank, which is now known as the First National Bank. By the time he was 23 years of age, he had risen to the position of cashier, serving as such until 1862. He was the youngest bank cashier in that section when he accepted the position. A short time prior he had become a member of the banking firm of Wick Bros. & Co. of Youngstown, and, in 1865, in connection with William Coleman and S. Q. Porter, he started the first bank in Sharon, Pa., under the name of Wick, Porter & Co. Soon after he became prominently identified with the development of numerous railroads and was largely interested in iron, coal and other industries.

The Taylor-Wilson Mfg. Company, McKees Rocks, Pittsburgh, manufacturer of castings, machine molded gears, tube works machinery, &c., has just completed shipments on an order for 250 standard gauge charging cars to the Indiana Steel Company, Gary, Ind. The cars placed end to end would run over a half mile in length, and 50 railroad cars were required to make the entire shipment.

The special meeting of the American Steel Foundries stockholders to pass on the proposed capital reorganization, which has been postponed from time to time since last winter, has been again adjourned, this time to June 12.

## PERSONAL.

Charles B. Crook of the Lidgerwood Mfg. Company, New York, has returned from a several weeks' business trip to Panama.

J. T. Ware, who has been connected with the operating department of the Birmingham Coal & Iron Company, for a number of years, has been appointed assistant sales agent with headquarters in Birmingham, Ala.

F. L. Fairchild of the C. & G. Cooper Company, engine manufacturer, Mt. Vernon, Ohio, spent several days in New York this week on a business trip.

A party of directors and others interested in the Moose Mountain Ore Company left Toronto June 9 on an inspection trip to the company's iron mine at Moose Mountain, going via Sudbury, Ont. The railroad to the property, which has been under construction for some time, has recently been completed and shipments will be made this season if there is demand for the ore. The party includes J. J. Mitchell, John Lambert and J. C. Hutchins, Chicago; John W. Gates, New York; E. W. Oglebay and L. B. Miller of Oglebay, Norton & Co., Cleveland; D. D. Mann of McKenzie & Mann Company, Toronto; C. H. McCullough, Lackawanna Steel Company, Buffalo, and Joseph Sellwood, Duluth.

O. P. Cherdron, San Francisco, has severed his connection with the Arthur Koppel Company and will start East on an extended business trip, going to Europe before returning to California.

J. B. McColl, formerly associate professor of steam engineering at Purdue University, Lafayette, Ind., and now connected with the engineering department of the American Blower Company, Detroit, has been delivering a series of illustrated lectures before engineering classes of the technical schools in the Middle West on the movement and heating of air for heating, ventilating and drying systems, the theory and practice of blower design and installation, and kindred topics.

John S. Stover, Milwaukee, has been named as the Wisconsin representative of the Columbus Machinery Company, Columbus, Ohio, which has recently filed articles of incorporation to do business in the State of Wisconsin.

Archibald Johnston, president of the Bethlehem Steel Company, has gone abroad in the interests of his company. Charles M. Schwab, chairman, sailed on the same steamer for the ocean trip.

Francis G. Echols of the Pratt & Whitney Company, Hartford, Conn., has returned from a European trip on the business of the company.

Leroy A. Williamson has severed his connection with the Niles-Bement-Pond Company and associated himself with the Automatic Sealing & Stamping Machine Company, 48 Custom House street, Providence, R. I. He had been ill for some time, but is now in condition to resume attention to business.

August Marx, general manager of the Philadelphia Roll & Machine Company, Philadelphia, Pa., will sail early in July for a sojourn of several months in Europe.

Ira A. Thomas has become connected with the sales department of the Niles Iron & Steel Company, Niles, Ohio.

Emil Swensson, consulting engineer, Pittsburgh, has received credentials from the Pittsburgh Chamber of Commerce for the gathering of data in foreign lands on how to prevent damage by floods. He will probably go abroad this summer for that purpose.

Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers, and Dr. C. B. Dudley of Altoona, Pa., made addresses at the opening of the Drown Memorial Building at Lehigh University, South Bethlehem, Pa.

James Gayley, first vice-president of the United States Steel Corporation, expects to sail for Europe early in July on matters connected with his dry air process.

W. J. A. London has accepted the position of chief engineer of the Terry Steam Turbine Company, Hartford, Conn., succeeding C. E. Terry, recently deceased.

Mr. London's experience in the turbine industry has been extensive, dating from his early connection with the C. A. Parsons Company, Newcastle, England, and later with the Brown-Boveri Company, Baden, Germany, and the British and American Westinghouse companies.

## The History of Expanded Metal.

Expanded metal, the commercial name for a material having a worldwide use and which consumes yearly many thousand tons of steel sheets in its manufacture, had its beginning in an occurrence in which a half-grown hog played a prominent and useful part. The inventor, John F. Golding, then a Chicago newspaper man, was on a sleeping car on his way to New York in the fall of 1884, when his train was stopped for a while near a field of ripening corn, inclosed by a fence made of plain wire stretched from post to post. While looking out of the window, he noticed a pig approaching the fence, through which he passed by pushing his head and body between the wires, thereby gaining easy access to the desired corn. This was done with an air of assurance indicating that the spring of the wires had been numerous under previous tests.

The evident defect in the fence led Mr. Golding to study methods of prevention. His first conclusion was to connect the wires at intervals by perpendicular strands as is now done in the woven wire fencing in common use. This prompted the further inquiry, why not utilize sheet steel and make large meshes by slitting the metal and then push out or expand to form a diamond shape?

Realizing the value of the invention, Mr. Golding went to Washington and filed application for patents, and then sought the co-operation of capital, which he found in the person of Oscar Bradford, then president of the Curtis & Co. Mfg. Company, St. Louis, who interested Henry Semple Ames, Henry S. Turner and R. H. Floyd-Jones, all of that city, in a company of which he became president, which position he has held continuously to this time.

Mr. Golding's mechanical ingenuity devised practicable machines of the "guillotine" type, and the industry was launched, first as a material for fencing, but later its adaptability in smaller meshes for plastering lath and for concrete reinforcement led to an invasion of fields with wider opportunities.

Manufacturing plants were established in the leading European countries and Australia, and the business enjoyed a healthy growth, but realizing the necessity for more rapid methods of production Mr. Bradford began to look around for a rotary machine. The initial idea came from W. L. Caldwell, now of Canton, Ohio, which when improved upon by the inventions of Lewis E. Curtis of Chicago, reached fruition in a machine with a capacity twenty times greater than the old time guillotines. This second birth of the industry gave it an immense impetus, and it is now going forward by leaps and bounds to a development which will make it one of the leading factors in sheet tonnage. The manufacture and distribution of the material have been well taken care of by Chess Bros., Pittsburgh; the Eastern Expanded Metal Company, Boston, and the Northwestern Expanded Metal Company, Chicago. More recently the American Sheet & Tin Plate Company has entered the field under license from the Ames Steel Lath Company, St. Louis, which controls the patents on the rotary process.

The Reineke & Wagner Pump & Supply Company, Pittsburgh, has secured the contract from the city of Johnstown, Pa., for two 7 x 8 triplex pumps, to be operated by two engines manufactured by the Otto Gas Engine Company. Other sales include a 24-in. Gould deep well working head, to the Ivanhoe Furnace Company, Ivanhoe, Va.; a 4½ x 6 electric sinking pump, to the Dan Gold Mining Company, Baker City, Ore.; a 6 x 8 pump to the Armstrong Cork Company, Pittsburgh, and a 12 x 36 in. steam head for forcing water from a deep well, to the Andrews & Hitchcock Company, to supply its plant at Youngstown, Ohio.



## A Systematic Scheme for the Analysis of Basic Slags, &c.

BY GORDON MILLS.

The analytical methods described in most text books are usually most painfully slow and cannot as a rule be carried out exactly as given, without getting badly "left," as regards time. Especially so is this the case with the complete analysis of basic slags and similar material, which contain so many constituents of like nature, thus requiring great care in manipulation, which, of course, means the expenditure of more or less valuable time.

After considerable experience with such material, the writer can strongly recommend the following scheme of analysis, which has the advantage of being conducted in a systematic manner, combining accuracy with rapidity—most important considerations for the busy work's chemist. Naturally this scheme will be equally applicable, with suitable modifications, for the analysis of any other material of a similar nature,—e. g., iron ores, &c.

### The Method.

**Silicon.**—One gram of the sample ground to an impalpable powder is placed in a No. 1 beaker, to which about 10 c. cm. of water has been added. After thoroughly disseminating the sample by shaking, add about 30 c. cm. strong hydrochloric acid, gradually shaking the beaker in the meantime. Now heat to boiling, evaporate to complete dryness, and bake for a few minutes. When cool add 20 c. cm. hydrochloric acid, bring to boil, and add about 30 c. cm. water. After boiling for a few minutes, filter on an ashless filter paper, wash well with hot water and a little hot dilute hydrochloric acid (1 to 4), afterward finishing with the hot water again. Dry and ignite, and weigh the residue, which should be perfectly white (which is usually the case with basic slags, unless much chromic acid be present). If the residue is not white add a few drops of hydrofluoric acid and sulphuric acid, and treat in the usual way, the loss in weight after ignition being the silica. The residue remaining in the platinum crucible is dissolved out by means of hydrochloric acid and added to the filtrate.

**The Filtrate.**—This is made up to 500 c. cm. in a graduated flask, and well shaken. This, for convenience, is designated the "stock solution."

**Alumina.**—Half, that is 250 c. cm. of the "stock solution" is taken by means of a standard pipette, such being equal to 0.5 g. of the sample and transferred to a liter flask. About three drops of strong nitric acid is now added and the solution brought to boiling; then ammonia is added drop by drop until a slight permanent precipitate shows up, which dissolve with about two drops of hydrochloric acid. Now dilute to about 500 c. cm. with water, heat to boiling and add about 15 c. cm. of ammonia acetate (saturated solution), quickly filter while hot, washing well with hot water. If the slag contains a large percentage of manganese, the basic acetate separation must be repeated as before, the second filtrate being added to the first, but this refinement is not usually necessary in ordinary routine work. The filtrate is reserved for estimation of the manganese, &c. The precipitate of the basic acetates is dissolved in hydrochloric acid and diluted to about 500 c. cm. with water, heated to boiling, when ammonia is added drop by drop until the solution is of a dark brick red color, but contains no precipitate. Add 3 c. cm. of strong hydrochloric acid and 2 g. of sodium phosphate, previously being dissolved in water and filtered; stir until the precipitate formed has all disappeared. Now add 10 g. sodium hyposulphite, and 15 c. cm. acetic acid (1.04 sp. gr.). Boil for about 10 min., filter as rapidly as possible, washing with hot water very thoroughly, dry and ignite,\* and weigh as aluminum phosphate, which multiplied by 0.4185 gives the weight of alumina.

**Manganese.**—The filtrate from the basic acetate separation is evaporated to about 300 c. cm. if necessary. Now add a quantity of bromine water, allow to stand a

little time, with occasional shaking, afterward adding ammonia in sufficient excess to smell strongly; heat to boiling. Allow to stand a little while, afterward filtering and well washing the precipitate with hot water; ignite and weigh as  $Mn_2O_3$ . If preferred, however, the manganese tetroxide precipitate may be dissolved in sulphurous acid and precipitated as ammonium-manganese phosphate.

**Lime.**—To the filtrate add a little C. P. tartaric acid\* and a little ammonia, if necessary, to make the solution smell strongly. Heat to boiling and add a boiling saturated solution of ammonium oxalate, and continue boiling for a few minutes. Allow to settle, filter upon a close filter paper, and wash thoroughly with hot water. Return the filter and contents to the beaker in which the precipitation was effected. Add about 500 c. cm. water and enough sulphuric acid to dissolve the calcium oxalate, heat to boiling and titrate with potassium permanganate until a pink tinge is produced, exactly as is usual with the titration of iron. The iron value of the potassium permanganate multiplied by 0.50 equals the value for lime.

**Magnesia.**—Evaporate the filtrate to small bulk, allow to cool, add microcosmic salt or ammonium phosphate and about one-fourth bulk of ammonia, stand in ice cold water, stirring vigorously in the meantime and allow to stand over night. Filter and wash thoroughly with water containing one-third volume of ammonia and about 100 g. of ammonium nitrate per liter; ignite carefully at low heat, raising the temperature when the carbon of the paper has been consumed, and weigh as magnesium hypophosphate, which multiplied by 0.36243, gives the weight of magnesia.

**Phosphorus.**—Take 50 c. cm. of the original stock solution by means of a standard pipette, which will be equal to 0.1 gm. of the sample. (If, however, the slag is not very high in phosphorus, 100 c. cm. or more must be taken.) Evaporate the solution to a syrup in a suitable sized beaker, when add about 5 c. cm. strong nitric acid and again evaporate to a syrup, in order to drive off all the hydrochloric acid; now take up with about 30 c. cm. nitric acid (1.2 sp. gr.), add ammonia and precipitate the phosphorus by means of ammonium molybdate in the usual manner. The phospho-molybdate precipitate is either dried and weighed, or, which is more preferable, estimated volumetrically by the alkalimetric or potassium permanganate titration methods, just as the operator desires.

**Iron.**—The remainder of the original stock solution, which in this case will be equal to 200 c. cm., and equivalent to 0.4 g. of sample, is evaporated somewhat, the ferric iron being reduced by means of zinc or other convenient reductor, and titrated in the usual manner, either with potassium bichromate or potassium permanganate, as the operator chooses. In most cases, however, it is preferable to estimate the iron upon a fresh sample, in which case 1 g. is taken and dissolved with hydrochloric acid in a suitable sized flask, it being reduced just as soon as the solution is complete, it being entirely unnecessary to remove the silica previous to reduction.

**Sulphur.**—This can be most conveniently estimated volumetrically by the following method with rapidity and a fair amount of accuracy: From 2 g. to 5 g. of the sample is placed in an ordinary sulphur flask, together with about an equal weight of metallic zinc, and treated exactly as though estimating the sulphur in iron or steel.

The Riter-Conley Mfg. Company, Pittsburgh, is about to begin the construction work on four more blast furnaces for the Indiana Steel Company, Gary, Ind. About 12,500 tons of plates and other shapes will be used in these four furnaces. The Riter-Conley Company has already built four furnaces at Gary, its contract having provided for eight. All through the industrial depression the building of the Gary plant has continued with unabating energy. The prediction has been made that the entire new plant will be in full operation by the middle of next year.

\* Ignite in a porcelain crucible at a very low heat until all the carbon of the filter paper has been consumed, afterward increasing the temperature.

\* This addition of tartaric acid, which must be free from lime, is very important, especially if the slag be very high in phosphoric acid, as it prevents a proportion of the phosphorus from being precipitated with the calcium oxalate.



## NEWS OF THE WORKS.

### Iron and Steel.

The damage done by the recent fire at the plant of the Dominion Iron & Steel Company, Sydney, Cape Breton, was much exaggerated in the press reports. The building destroyed was a light frame structure, one story high, which covered three or four pipe threading machines used in connection with an outdoor bending forge where the pipe fitters worked on larger jobs than could conveniently be accommodated in the machine shop. Such repairs as will be required to put the machines in working order again and to reconstruct the building will only cost about \$2000, which is fairly covered by insurance. The fire caused no interruption in operations, and the machines are being repaired and will probably be housed in a convenient building within a few weeks.

### General Machinery.

The Albany Foundry & Machine Works, Albany, Ga., recently organized, has leased the plant of the Bacon Equipment Company and will do general foundry and machine work, making a specialty of boiler and locomotive repairs. J. J. Anderson is president and general manager, and F. M. Farley, Jr., secretary and treasurer.

The Poughkeepsie Foundry & Machine Company, Poughkeepsie, N. Y., has increased its capital stock from \$25,000 to \$50,000. The increased capital will be used for improvements which have already been made. The company has a comparatively new plant and anticipates making no additions at the present time.

The Department of Parks, New York, will receive bids until June 18 for one 12-ton three-wheeled steam road roller.

It is stated that the Marin County Gas Company, Sausalito, Cal., will erect a plant to produce gas from crude petroleum for cooking and heating purposes for which the following equipment will be required: Boilers, engines, steam pumps, blowers, gas compressors, &c. Charles P. Greenwood & Co., San Francisco, are the engineers in charge.

Some little equipment will probably be purchased through the purchasing department of the Fort Worth & Denver City Railroad at Denver, Colo., for replacing the machines burned at the recent fire which completely destroyed the shops at Childress, Texas. The machine shop, blacksmith shop, boiler shop and copper shop at Childress were completely destroyed by fire and some of the machinery was only slightly damaged; the boilers were not injured very much. It is the intention of the company to rebuild these shops as quickly as possible.

The Moore Drop Forge Company, Springfield, Mass., is enlarging its plant by the erection of a 40 x 90 ft. addition to its machine shop and entirely new offices.

### Power Plant Equipment.

The York Haven Water & Power Company, York Haven, Pa., has placed contracts for the additional machinery for enlarging the capacity of its plant from 10,000 to 20,000 hp. The generators will be furnished by the General Electric Company, Schenectady, N. Y., and the water wheels by the Poole Engineering & Machine Company, Baltimore, Md. An electric crusher to be installed in the quarries has also been purchased.

The Board of Aldermen of Columbia, Miss., will receive bids until June 30 for the construction of a complete water works and sewer system, plans and specifications for which can be seen after June 15.

The Board of Public Works, Grand Rapids, Mich., will receive bids until June 25 for a 12,000,000-gal. vertical triple expansion pumping engine for the water works pumping station.

The Louisiana Light, Power & Traction Company, Louisiana, Mo., of which F. E. Murray is secretary, has under consideration the erection of a new power plant and extension of lines.

The City Council of Elizabeth, N. J., will receive bids until July 1 for a pumping station.

The Gillie Machine Company has been incorporated at North Tonawanda, N. Y., to take over the business of the Gillie Engine & Machine Company. The capital stock is \$15,000. The directors of the new company are John B. Gillie, Wm. M. Gillie and Paschal S. Humphrey.

### Foundries.

The Aluminum Foundry Company, Manitowoc, Wis., which makes a specialty of automobile castings in aluminum, has in contemplation the making of some additions to its plant, but plans are as yet undeveloped and nothing will be done until this fall, and possibly next year.

### Fires.

The plant of the Lorena Foundry Company, Bridgeport, Pa., was damaged \$10,000 by fire June 3.

The plant of the Best Mfg. Company, Pittsburgh, Pa., was damaged \$25,000 by fire June 3. The fire will not interfere in the filling of contracts by the company for piping equipment for power plants and blast furnaces.

The plant of the Graff Stove & Furnace Company at Dickson City, near Scranton, Pa., was burned June 6, with a loss of \$50,000.

The plant of the Erie Foundry Company, Erie, Pa., was damaged \$50,000 by fire June 2.

The packing plant of the National Packing Company at Portland, Ore., was destroyed by fire May 28, the loss being about \$25,000.

An explosion of dynamite wrecked a 20-ton steam derrick at the plant of the Van Dorn Iron Works, Cleveland, Ohio, June 3.

The machine shop of the Victoria Machinery Depot, Victoria, B. C., was burned June 8, the loss being about \$50,000.

### Hardware.

The Denton Woven Wire Fence Company, Denton, Texas, has been incorporated with a capital stock of \$25,000, the incorporators being M. S. Stout, G. H. Blewett, L. L. Fry and T. K. Blewett.

### Miscellaneous.

The National Fire Proofing Company, Pittsburgh, has secured a large contract for fireproofing for the new depot of the Pennsylvania Railroad in New York, another large contract for fireproofing in New York and the material for the new post office being erected at Atlanta, Ga.

The Wolf River Paper & Fibre Company, Shawano, Wis., has not yet prepared plans for rebuilding its plant which was recently destroyed by fire, and does not know just when it will be ready to receive bids for reconstructing and equipping the buildings.

Joseph R. Ford, Arthur G. Wellington and Howard Carlton have been appointed ancillary receivers of the South Baltimore Steel Car & Foundry Company, Baltimore, Md.

The S. B. Patch & Sons Company, Streator, Ill., has been incorporated, with a capital of \$8000, to manufacture and deal in iron, steel and metal.

Bids will be asked by the city of East Moline, Ill., in a short time, on pipe and material for the extension of water mains. The amount to be expended is estimated at \$29,600.

The Dahlquist Mfg. Company, 36-40 West Third street, South Boston, Mass., has added a metal spinning department to its factory and will do general work in all metals from sheet iron to silver.

The G. Drouvé Company, Bridgeport, Conn., has completed orders for the Lovell window operating apparatus for the United Illuminating Company, Bridgeport, installed in the new addition to the power house; Bristol Company, Waterbury, Conn., and the General Fire Extinguisher Company, Providence, R. I.

The Chapman Ball Bearing Company, Boston, Mass., has secured the contract for equipping the new shops of the Grand Trunk Railroad at Battle Creek, Mich., with the 2 5-16 in. double ball bearings, of which 124 will be used. The company is also equipping the plant of the Wiegele Riveted Pipe Company, Denver, Colo.

## Trade Publications.

**Melting Furnaces.**—The Hawley Down Draft Furnace Company, Chicago, Ill. Catalogue. Illustrates the Schwartz metal melting and refining furnace, adapted to brass, copper and other metals. Gives numerous views of the Schwartz furnace, which is of a tilting type, using crude oil, fuel oil or gas for fuel. The furnaces are lined with fire brick, the combustion being abetted by a down draft, and are built in eight regular sizes. The smallest one, designed for experimental and metallurgical uses, has a capacity of 100 lb. of bronze, while the large size, having a shell 120 in. in diameter, has a capacity for 10 tons of bronze or 6 tons of iron. Considerable miscellaneous information regarding the various alloys of copper, zinc and lead is given.

**Precision Bench Lathe and Watchman's Clocks.**—McDowell, Stocker & Co., Chicago. Post card. Announces the completion of a new illustrated catalogue describing the Cata-ract precision bench lathe with its attachments, which is now ready for distribution; also states that the firm is agent for the Beyer watchman's portable clocks.

**Gas and Gasoline Engines.**—Angola Engine & Foundry Company, Angola, Ind. Catalogue, 24 pages. Describes a line of stationary and portable engines of 2½ to 15 hp., designed for pumping or other service. A particular feature to which attention is especially directed is an improved timing device. It is designed to retard the spark until the crank is past the inner center, thus compelling the engine to rotate in the desired direction.

**Conveying and Transmission.**—A monthly publication issued by the Stephens-Adamson Mfg. Company, Aurora, Ill., contained in the April number a series of complete tables giving the dimensions of hubs and arms for cast iron double belt pulleys, which is said to be the first table of the kind published. Sectional drawings are also given of 33 different patterns of cast iron pulleys, both of standard and special types.

**Works and Products.**—Allis-Chalmers Company, Milwaukee, Wis. Booklet. Gives some interesting facts and figures re-

garding the various plants of the company, chief of which is the works at West Allis, Milwaukee. Illustrative of the character of work turned out by the company are given several engravings and descriptions of notable machines, both finished and in the process of construction. Attention is especially directed in this pamphlet to the rapid advances made in steam turbines, cement making machinery and electrical generative units.

**Blowers.**—The Connersville Blower Company, Connersville, Ind. Catalogue No. 11, 12 x 19 in. Cloth covers, 32 pages. Describes a line of smelter blowers the design of which is well illustrated by drawings and line engravings, showing detail of construction. A number of photographs of special installations are shown, notably one of special heavy duty smelter blowers coupled directly to tandem compound Corliss engines. Pages 25 to 27 contain valuable data of a series of tests made on these units. Views of the company's latest cycloidal pumps, which are built in sizes ranging from 1000 to 10,000 gal. per minute, are also shown. Page 5 is devoted to a compilation of facts relative to combustion which will be found convenient for reference.

**Shoemaking Machinery, &c.**—Booth Bros., 22 Brown's Race, Rochester, N. Y. Leaflets. These deal respectively with the Booth ink shaker, box strap, impression stitch wheeling and burnishing machines, Victor beader, second row marker, patent leather tip scourer, improved Columbia beader, and Fudge edge maker.

**Motors, Generators and Panels.**—Crocker-Wheeler Company, Ampere, N. J. Four bulletins. No. 95 illustrates and describes the company's belt type alternating current generators; No. 97, type 1, 125-250 volt direct current switchboard panels; No. 98, superseding No. 78, form L, belt type, direct current motors in sizes from 1-20 to 5 hp. and generators from 0.6 to 2.5 kw, and No. 100, form I, belt type, direct current motors in sizes from 5 to 45 hp. and generators from 4½ to 40 kw.

**Lathes and Boring Mills.**—Gisholt Machine Company, Madison, Wis. Bulletins and binder. This comprises a new series of Gisholt bulletins so far as issued, and to which new ones will be added from time to time, describing different labor saving machine tools such as turret lathes, vertical boring and turning mills and universal tool grinders. The initial six pages treat of the Gisholt turret lathe, and 30 and 36 in. vertical boring mills.

**Riveters, Reamers and Shakers.**—Hanna Engineering Works, 820 Elston avenue, Chicago, Ill. Circulars. One gives illustrations and brief specifications of Hanna riveters, which are made in a variety of styles and sizes; Hanna reamers for bridge, ship, car and other structural shops, and Hanna shakers for riddling foundry sand by air, electricity or steam. The other circular contains facsimiles of testimonial letters received by the company.

**Motors, Generators and Outlet Boxes.**—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Instruction book and circular. The instruction book, No. 226, pertaining to round type motors and generators, discusses their installation and care, location, unpacking, connections, their various parts, instructions for starting, and gives a number of wiring diagrams. Circular 428, applying to section 10 of price-list 423, contains illustrations, specifications and prices of stamped steel outlet boxes and fittings.

**Hoisting Crabs and Winches.**—Harry E. McCoy, 609 Ferguson Block, Pittsburgh, Pa. Pamphlet. Shows hoisting crabs and winches for wire and manila ropes. Dimensions and prices are included.

**Steam and Water Specialties.**—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Gives illustrated descriptions of Anderson cushioned nonreturn valves, the Gould safety continuous feed water regulator, and the Golden self-closing and tempering protective water gauge.

**Locomotive Cranes.**—Brown Hoisting Machinery Company, Cleveland, Ohio. Catalogue K. Size 6 x 8½ in.; pages 39. Contains illustrations of Brownhoist locomotive grab bucket cranes handling coal, sand, ore, ashes, &c., from stock piles, gondola cars, barges, &c., from which the possibilities attending the use of the equipment will be apparent. A partial list of users classified by States is appended.

**Gaskets.**—U. S. Indestructible Gasket Company, 16 South William street, New York. Circular. Refers to the company's U. S. Indestructible elastic metal gaskets of copper, lead, bronze, brass, steel, &c., and special gaskets of wood, silver and prepared paper.

**Internal Grinders.**—Heald Machine Company, Worcester, Mass. Catalogue. Gives illustrations, a general description, details of construction, specifications, and a summary of superior points of the Heald No. 70 internal grinder. An illustrated description of this machine appeared in *The Iron Age* April 2, 1908.

**Gasoline Engines.**—Waterloo Gasoline Engine Company, Waterloo, Iowa. Catalogue No. 10, 7½ x 9½ in., 32 pages. Describes a line of gasoline engines, including stationary and portable types, especially adapted for various kinds of service. The horizontal type of construction is adopted for machines which are built on the alternating or four-cycle principle, hav-

ing an impulse at each second revolution. A line of small engines for pumping and dairy service is prominently shown, and attention is called to a special vapor cooling device operated by a fan, which in connection with the heat of the engine cylinder converts a water spray into vapor which is introduced through the cylinder head for cooling. A line of hand portable engines is also shown and the uses to which they may conveniently be put are illustrated.

**Small Motors, Dynamos and Annunciators.**—Holtzer-Cabot Electric Company, Brookline Station, Boston, Mass. Bulletins. No. 304B, displacing No. 304A, describes self-starting single phase induction motors and gives illustrations of assembled machines, parts and dimension sketches. No. 313 deals with type SS, ½ and ¾ hp. direct current motors, and No. 314 shows inclosed and seminclosed direct current motors and dynamos, type C. Electric annunciators of the new pattern O are described in bulletin No. 150A.

**Motor Driven Forge Blowers.**—Emerson Electric Mfg. Company, St. Louis, Mo. Bulletin No. 3305, replacing No. 3304, briefly describes the company's forge blowers direct connected to direct and alternating current motors and particularly designed for small factories, blacksmith shops, &c. No. 3213 describes a small bipolar ventilated motor which is made in ¾ and ½ hp. sizes.

**Metal Punches.**—W. A. Whitney Mfg. Company, Rockford, Ill. Circular. Shows the Whitney hand metal punch, which is made in sizes to punch holes up to ½ in.

**Blast Furnaces.**—William B. Pollock Company, Youngstown, Ohio. Supplement No. 10 to the company's general views of blast furnaces it has constructed. Shows progressive views of the Madeline furnaces of the Inland Steel Company at Indiana Harbor, Ind.

**Structural Steel Construction.**—Kenwood Bridge Company, Chicago. Altum. Gives numerous views of steel bridges and buildings in course of construction which have been erected by the company. The buildings include some large machine shops, railroad plants, steel works, grain elevators, &c., as well as some particularly large steel bridges. Sectional views of different forms of roof construction are also included.

**Coil and Elliptic Springs.**—Fort Pitt Spring & Mfg. Company, Pittsburgh, Pa. Circulars and specification sheets. Show types of coil and elliptic springs and how to order them. Another circular calls attention to the fact that the company repairs broken elliptic springs.

**Gas and Gasoline Engines.**—New Era Gas Engine Company, Dayton, Ohio. Catalogue No. 20N. Describes the New Era line of engines, which can be operated by natural gas, producer gas, gasoline, kerosene or alcohol. The different types of engines are shown and unassembled parts of machines are illustrated and their construction and special features are fully described. The engines are built in vertical pattern in sizes from 1½ to 5 hp. and in horizontal types from 8 to 150 hp.

**Oil Firing Systems.**—Schutte & Koerting Company, Philadelphia, Pa. Catalogue 6, section 0, pages 1 to 12. Describes two methods of the Koerting oil firing system, one devised for marine or stationary boilers or locomotives and another for steam jet oil burners. The first employs centrifugal spray nozzles. Both systems are illustrated with drawings and graphically explained.

**Water-Jet Eductors and Primers.**—Schutte & Koerting Company, Philadelphia. Catalogue 2, section M, pages 1 to 12. Illustrates the Koerting water-jet eductors, water economizers for fountains, sand washing plants and water-jet ash conveyors. Catalogue 4, section Q, shows the company's water-jet primers for priming siphons, centrifugal pumps, &c.

**Steam Specialties.**—Lagonda Mfg. Company, Springfield, Ohio. Pamphlet. Describes principally the Lagonda automatic boiler cut-off valve and reproduces newspaper clippings describing steam pipe and boiler explosions and accidents resulting from the breaking of ammonia pipes, which would have been avoided if the cut-off valves had been installed. The Weinland thrust bearing turbine cleaner and the Lagonda boiler tube cutter and reseating machines are also referred to in the pamphlet, and the former more at length in another circular.

**Gas and Gasoline Engines.**—Jacobson Machine Mfg. Company, Warren, Pa. Bulletin F. Contains a general description of the company's line of hit-and-miss type engines, which operate on the four-cycle system, taking an explosion every two revolutions. A general description of the line, with details of the parts, is followed by brief specifications and illustrations of the different types, including one for farm and general power purposes built in 3 to 6 hp. sizes; the same in portable equipments on skids; larger stationary engines, 8 to 35 hp., and the same in portable equipments on wheels.

**Steam Specialties.**—John Davis Company, Chicago, Ill. Catalogue, 6 x 9 in., 40 pages. Illustrates and describes the company's line of steam specialties, comprising about everything in the way of valves, indicators, regulators, governors, separators, &c., used in a steam power plant. The volume includes a sketch of a power plant showing the application of the company's specialties and the relative position of appliances. Useful tables and price-lists are given.



## The Iron and Metal Trades

So far as the attitude of the Iron trade can be gauged so soon after the announcement of the readjustment in prices on Steel Billets and certain lines of finished materials, it is one of disappointment. It is not radical enough and merely recognizes concessions which had been more or less openly made during recent weeks, and which had been undermining confidence both among sellers and among buyers.

The earlier cut in Steel Bars is now understood to have been the outcome of some low prices made at Chicago on material for agricultural implement makers and the lowering in the official price which followed has brought out only a part of the contract tonnage. This is believed to have aggregated about 60,000 tons out of total estimated requirements of about 200,000 tons.

We are officially advised that one of the leading independent sellers of Lake Iron ores is not yet ready to quote prices, although the firm in question is widely reported in the trade to have sold at a reduction of 50c. per ton. Other sellers, apparently, are now willing to make that concession to the furnacemen.

Although it was not specifically referred to at the meeting, it is understood that the delivered prices on Steel Billets and Sheet Bars make the same additions for freight to the new base price at Pittsburgh as heretofore; in other words, generally speaking, one-half the freight.

It is of course too early to judge whether the new prices on Finished Materials will encourage buying. The experience in the Steel Bar trade does not hold out much hope in that direction, and the character of the reduction does not seem to foreshadow any energetic movement in Shapes, Plates or Wire.

Steel Rails were not even referred to at the meeting Tuesday. It is understood that the Rail makers and the railroads have come much closer together, so far as the specifications are concerned, and that the acceptance of more onerous conditions is equivalent to a considerably increased cost to the makers.

Pig Iron in Birmingham has settled quite firmly down to \$12 for No. 2 Foundry, and the markets west of the Alleghenies are steadier and quieter. On the seaboard and in New England, however, the markets have been quite demoralized, owing to very sharp competition among Eastern makers. Eastern Pennsylvania makers have sold No. 2 Foundry as low as \$16.50 to \$16.75, delivered, in New England, the Buffalo makers apparently holding back. Considerable sales have been made on that basis. Foundry Iron has sold in the New York territory as low as \$15.50 to \$16, and low grade Irons have been placed below \$15 on the Delaware River. There have been large sales, aggregating 30,000 tons, of Basic Pig in eastern Pennsylvania, down to \$15.25, delivered.

An interesting transaction in the Pittsburgh District is the sale, on a sliding scale, of a total of about 75,000 tons of Basic Pig, to cover the requirements of an Open Hearth Steel plant in the district for a period of three years.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

June 10, June 3, May 13, June 12, 1908. 1908. 1908. 1907.

PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia .....	\$16.25	\$16.75	\$16.75	\$24.50
Foundry No. 2, Southern, Cincinnati .....	15.25	15.25	14.75	24.25
Foundry No. 2, Local, Chicago..	17.25	17.25	17.25	26.50
Bessemer, Pittsburgh.....	16.90	16.90	16.90	24.40
Gray Forge, Pittsburgh.....	14.90	14.90	14.90	23.15
Lake Superior Charcoal, Chicago	20.00	20.00	20.00	27.50

BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh...	25.00	28.00	28.00	29.50
Forging Billets, Pittsburgh....	27.00	30.00	29.00	34.00
Open Hearth Billets, Phila.....	26.20	29.20	29.20	32.50
Wire Rods, Pittsburgh.....		35.00	35.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago...	12.25	12.25	12.00	18.50
Steel Rails, Melting, Phila....	13.00	13.00	12.75	20.00
Iron Rails, Chicago.....	15.50	15.50	14.75	24.50
Iron Rails, Philadelphia.....	18.00	18.00	17.00	27.50
Car Wheels, Chicago.....	13.00	13.00	13.00	25.50
Car Wheels, Philadelphia.....	14.00	14.00	14.00	25.50
Heavy Steel Scrap, Pittsburgh..	13.00	13.00	12.75	18.50
Heavy Steel Scrap, Chicago....	11.50	11.50	10.50	16.00
Heavy Steel Scrap, Philadelphia	13.00	13.00	12.75	19.00

FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.	1.40	1.40	1.46	1.83½
Common Iron Bars, Chicago....	1.50	1.58	1.65	1.78
Common Iron Bars, Pittsburgh.	1.40	1.50	1.50	1.75
Steel Bars, Tidewater, New York	1.56	1.76	1.76	1.84½
Steel Bars, Pittsburgh.....	1.40	1.60	1.60	1.60
Tank Plates, Tidewater, New York	1.76	1.86	1.86	1.86
Tank Plates, Pittsburgh.....	1.60	1.70	1.70	1.70
Beams, Tidewater, New York...	1.76	1.86	1.86	1.86
Beams, Pittsburgh.....	1.60	1.70	1.70	1.70
Angles, Tidewater, New York...	1.76	1.86	1.86	1.86
Angles, Pittsburgh.....	1.60	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.55	1.55	1.55	1.85
Skelp, Sheared Steel, Pittsburgh.	1.65	1.65	1.65	1.90

SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh.....	1.95	2.05	2.05	2.00
Cut Nails, Pittsburgh.....	1.80	1.85	1.90	2.05
Barb Wire, Galv., Pittsburgh...	2.50	2.50	2.50	2.45

METALS, Per Pound:				
	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York.....	13.00	13.00	12.75	24.25
Electrolytic Copper, New York..	12.75	12.62½	12.62½	23.00
Spelter, New York.....	4.57½	4.55	4.60	6.50
Spelter, St. Louis.....	4.42½	4.40	4.50	6.40
Lead, New York.....	4.50	4.35	4.25	5.75
Lead, St. Louis.....	4.35	4.20	4.12½	5.65
Tin, New York.....	28.25	28.85	29.50	42.10
Antimony, Hallett, New York...	8.50	8.50	8.50	14.00
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York...	\$3.89	\$3.89	\$3.89	\$4.00

## Chicago.

FISHER BUILDING, June 9, 1908.

The developments of last week shifted the focal point of market interest from Pig Iron to Finished Material. This was in part due to the waning force of activity in the former, but principally to the unexpected decline in Steel and Iron Bars. Since the implement makers' annual requirements, comprising an aggregate estimated at around 200,000 tons, were seemingly the target aimed at in this quick reversal of position by the associated Steel makers, the fact that the price basis seems to have met with approval is of pertinent interest. In addition to 40,000 tons of Steel Bars booked since then by the United States Steel Corporation mills, contracts secured by other interests will bring the total for the week well up to 60,000 tons. In the meantime specifications are tardy in coming out and rolling schedules are too scantily supplied to permit other than intermittent runs. The effect of the decline in Bars upon other finished products has been distinctly unfavorable. Such an announcement at the time of the May meeting of the allied interests in New York would have been regarded as a carefully considered step; but closely following the assurance then given that prices would be maintained, it gives rise to impression that it was due to some cause unforeseen at that time. More hesitancy in the closing of Structural contracts involving large tonnage is observed, but a considerable number of small deals are going through which altogether are of material help in sustaining activities in fabricating shops. Bids on recent contracts disclose the offer of low prices that make it plain



there has been no improvement in this direction. Between the three lowest bids tendered on the Structural Material for the Aqueduct Cement plant at Los Angeles, Cal., there was a difference of about 20 per cent., the bids running respectively \$40,800, \$44,000 and \$49,365. Plates, Sheets, Pipe, Tubes and Metals are in extremely light demand, the strength of which is directly commensurate with actual consumption. Although consumers generally are not actively in the market for Scrap, prices exhibit a degree of firmness that under the circumstances is unusual. This condition is ascribed to important purchases by dealers made to cover short sales; it is especially true of Re-rolling Steel Rails, of which several thousand tons offered last week by the railroads were taken mostly by dealers.

**Pig Iron.**—Sales for the week were in the main comprised of the requirements of small melters who, failing to get in at the bottom, are being gradually convinced that the present price level is the best that will be offered for third quarter, at least. Though the orders entered were considerable in number, the entire tonnage placed was small, in comparison with that of recent transactions. The market has settled quite firmly at \$12, Birmingham, and it is doubtful if any business even for June shipment would find acceptance at lower than this price. The Woodward Furnaces are reported to be practically out of the market for third quarter business. Some of the Southern furnaces have advanced to \$12.50, for fourth quarter, which of course means practical withdrawal from the market, since buyers are not ready to accept such an advance. On the other hand, the majority of furnaces are unwilling to adversely discount the future. Under these conditions, therefore, the prospects for a quiet period of several weeks seem good, unless there is in the meantime a decided improvement in the foundry melt. The Northern situation has been likewise strengthened, and while \$17, at furnace, generally prevails, at least one prominent interest has moved its price to \$17.50, at furnace, on all deliveries subsequent to July 1. The following prices are for June delivery, f.o.b. Chicago:

Lake Superior Charcoal	\$20.00 to \$20.50
Northern Coke Foundry, No. 1	17.75 to 18.25
Northern Coke Foundry, No. 2	17.25 to 17.75
Northern Coke Foundry, No. 3	16.75 to 17.25
Northern Scotch, No. 1	18.25 to 18.75
Southern Coke, No. 1	16.85 to 17.35
Southern Coke, No. 2	16.35 to 16.85
Southern Coke, No. 3	15.85 to 16.35
Southern Coke, No. 4	15.35 to 15.85
Southern Coke, No. 1 Soft	16.85 to 17.35
Southern Coke, No. 2 Soft	16.35 to 16.85
Southern Gray Forge	14.35 to 14.85
Southern Mottled	14.10 to 14.60
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	18.40 to 18.90
Jackson Co. and Kentucky Silvery, 6 %	18.90 to 19.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

**Billets and Rods.**—There is no market for Billets nor is there any inquiry that would indicate even passive interest on the part of consumers.

**Rails and Track Supplies.**—New Rail orders amounting in all to about 7000 tons have been entered since last report, in which were included 1000 tons for the new Chicago-Milwaukee traction line. As far as known, no other Rail orders of significant size are pending. Specifications, however, are being furnished more liberally, enabling the No. 1 mill at the South Works to continue operations at a fair gait. A considerable number of moderate sized orders for Light Rails are coming out, and though the aggregate tonnage for last month showed a marked increase, there is yet much room for improvement. Very few new orders for Track Supplies are in evidence, but it is generally expected that the railroads will pass a lot of held up requisitions for such material soon after July 1. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c. to 1.70c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.25c. to 2.35c., base, Square Nuts, and 2.40c. to 2.50c., base, Hexagonal Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., \$28; 20-lb., \$29; 16-lb., \$30; 12-lb., \$31. Standard Sections, \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—As indicative of the character of orders now being placed, it may be mentioned that in the 1300 tons which comprised the aggregate of closures for the week by the leading interest, the largest lot was under 100 tons. The execution of small enterprises seems to be progressing without much hesitation, but many of the larger projects are still holding back. The effect of the recent reduction in Steel Bars has been felt in Structural Shapes in that it has strengthened existing doubt as to the future maintenance of prices in this and other departments. Material for several good sized structures are being figured on by fabricators, principal among which are 500 tons for the Chicago City Railway Company's new car barn; 1000 tons for a Y. M. C. A. building, Milwaukee, and a tonnage of fair size for a large Steel warehouse, to be erected at Market street, near Randolph street, Chicago, by B. A. Eckhart. Bids will soon be asked for on the new Chicago City Hall, for the construction of which about 12,000 tons of Steel will

be required. No new railroad contracts have been closed and not much is in prospect for the immediate future.

**Plates.**—Business is still confined to scattering small orders and shows no signs of early improvement. The principal Plate using industries, such as car works, shipyards and boiler and tank shops, are either shut down or running very light, and are not extending purchases beyond absolute present needs. Jobbers are not increasing stocks, being anxious to reduce them as far as possible.

**Sheets.**—New business coming to the mills is sharply reduced. Orders from jobbers include only such small lots as are imperatively required to keep size assortments unbroken. Manufacturers in placing orders consider only work in hand and are not inclined to make provision for prospective needs. Prices are firm and regular, at ruling quotations, except for concessions of \$1 to \$2 a ton offered by a few unimportant producers. We quote mill shipments, as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.20c.; No. 12, 2.25c.; No. 14, 2.30c.; No. 16, 2.40c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

**Bars.**—The implement interests have responded with fair liberality to the late concession of \$4 a ton on Steel Bars. Since the announcement of the price of 1.58c., Chicago, last Tuesday, the principal interest has entered contracts for about 40,000 tons to apply on the requirements of implement makers for the ensuing season. Another prominent maker has booked contracts of like character for around 8000 tons. This tonnage alone represents nearly 25 per cent. of the estimated total of the agricultural requirements, which amounts to something like 200,000 tons. This movement has no bearing on present mill activities as specifications are not yet furnished against the new contracts and little is coming in on old ones. A corresponding reduction has been made on Iron Bars, making the price \$1.50, Chicago; the new price has not brought out many new orders but more inquiries have developed, which indicate renewed interest. Revised prices, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13 and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

**Merchant Pipe.**—In view of the long continued practice of buying in small lots only to meet current demands, jobbers' stocks must of necessity be greatly reduced; but the situation offers no inducement for materially increasing them or placing forward contracts. The recent drop in prices of Steel and Iron Bars has weakened the not over strong confidence of buyers in the ultimate success of the effort to maintain values at their present level, and it is likely that for the present, at least, the demand will be measured by the requirements of consumers.

**Boiler Tubes.**—Reflecting the inactive operation of boiler shops, orders for Merchant Tubes are both infrequent and small. The demand for Locomotive Tubes is equally quiet, but a better run of orders is expected from the railroads after July 1. Mill quotations for future delivery, on the base sizes, are as follows: 2½ to 5 in., in carload lots. Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1½ to 2½ in.	50	35	35
2½ in.	52½	35	35
2½ to 5 in.	60	47½	47½
6 in. and larger	50	35	35

**Merchant Steel.**—Following the news of a decline in Steel Bar prices, inquiries have increased though there has, thus far, been no material improvement in actual demand. It is expected that implement makers will now enter the market for next year's supplies and a renewal of forward purchases is looked for. Revised quotations are as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish up to 1½ x ½ in., 1.73c., base, Steel card; Iron Finish, 1½ x ½ in. and larger, 1.78c., base, Tire card; Channels for solid Rubber Tires, ¾ to 1 in., 2.08c., and 1½ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.13c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7¼c. to 8c., and still higher prices are asked on special grades. Shafting, 56

per cent. off in car lots; 52 per cent. in less than car lots, base territory delivery.

**Cast Iron Pipe.**—Last week's transactions included no lots of notable tonnage, though a number of small orders for Water Pipe were let by various municipalities. Among those awarded were Ponca City, Okla., 300 tons; Cincinnati, Ohio, 700 tons; Springfield, Ill., 300 tons; Moorhead, Minn., 300 tons; Deshler, Neb., 325 tons; all of which were secured by the United States Cast Iron Pipe & Foundry Company. Quite a fair run of smaller lots ranging from 50 to 100 tons was booked. Such orders, it is noted, have grown more frequent in the past week or two. Since Pig Iron prices have stiffened up, a number of inquiries have been received for figures on Pipe for deliveries extending into next year, but founders are unwilling to consider propositions of this sort. We quote, nominally, per net ton, Chicago, as follows: Water Pipe, 4-in., \$27; 6 to 12 in., \$26; 16-in. and up, \$25; with \$1 extra for Gas Pipe.

**Metals.**—There has been a material increase in inquiries within the past week, and a somewhat better run of small orders. The latter feature is regarded as encouraging, since buying is almost exclusively for present consumption, and any improvement in the former means increase of the latter. Lead has stiffened up somewhat, and an upward tendency in price has developed. We quote as follows: Casting Copper, 13¼c.; Lake, 13½c. to 13¾c., in car lots for prompt shipment; small lots, ¼c. to ¾c. higher; Pig Tin, car lots, 32c.; small lots, 32½c.; Lead, Desilverized, 4.55c. to 4.60c., for 50-ton lots; Corroding, 4.90c. to 5c., for 50-ton lots; in car lots, 2¼c. per 100 lb. higher; Spelter, 5c.; Cookson's Antimony, 10¼c., and other grades, 9¾c. to 10¼c.; Sheet Zinc is \$7 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 12¾c.; Heavy Copper, 12¾c.; Copper Bottoms, 10¼c.; Copper Clips, 11c.; Red Brass, 11¼c.; Yellow Brass, 9¾c.; Light Brass, 6½c.; Lead Pipe, 4c.; Zinc, 3¾c.; Pewter, No. 1, 21c.; Tin Foil, 25c.; Block Tin Pipe, 27c.

**Old Material.**—The market is sustained only by the buying of dealers. Consumers are taking very little material of any kind except Rerolling Steel Rails; these are in good demand, several purchases having been made in the past week by the Bar mills. The price has been kept up by the effort of dealers to cover for deliveries on short sales, and it is largely due to this influence that prices have advanced 25c. a ton and are strong at the figures quoted. One sale to a local mill of 2000 tons of Rerolling Rails is reported to have brought \$14.50. Of the lots of railroad material reported, three, aggregating over 7500 tons, have been offered and the prices realized are said to be well in line with present quotations on all grades. Included in this tonnage was nearly 4000 tons of Steel Rails. Market conditions, however, do not seem to justify the apparent upward tendency of values except on Steel Rails. Lack of buying by consumers and heavy stocks in the hands of dealers, for which there is but scant demand, coupled with the heavy tonnage advertised for disposition by the railroads, form a combination of circumstances little calculated to inspire confidence in an upward movement. Railroad material included in the lists presented for bids this week amounts to 19,000 tons, of which over 5000 tons is Steel Rails, distributed as follows: Illinois Central, 5200 tons; Santa Fé, 2500 tons; Chicago & Northwestern, 1500 tons; Chicago, Milwaukee & St. Paul, 2500 tons; Northern Pacific, 1200 tons; Baltimore & Ohio, 6100 tons; Wisconsin Central, 350 tons. We quote per gross tons, f.o.b. Chicago, as follows:

Old Iron Rails.....	\$15.50 to \$16.00
Old Steel Rails, rerolling.....	13.75 to 14.25
Old Steel Rails, less than 3 ft.....	12.25 to 12.50
Rerolling Rails, standard sections, subject to inspection.....	19.00 to 20.00
Old Car Wheels.....	13.00 to 13.50
Heavy Melting Steel Scrap.....	11.50 to 12.00
Frogs, Switches and Guards, cut apart.....	11.75 to 12.25
Mixed Steel.....	9.50 to 10.00

The following quotations are per net ton:

Iron Fish Plates.....	\$13.50 to \$14.00
Iron Car Axles.....	16.50 to 17.00
Steel Car Axles.....	14.75 to 15.25
No. 1 Railroad Wrought.....	11.25 to 11.75
No. 2 Railroad Wrought.....	10.00 to 10.50
Railway Springs.....	11.00 to 11.50
Locomotive Tires, smooth.....	12.75 to 13.25
No. 1 Dealers' Forge.....	9.50 to 10.00
Mixed Bushing.....	6.75 to 7.25
Iron Axle Turnings.....	5.75 to 6.25
Soft Steel Axle Turnings.....	5.75 to 6.25
Machine Shop Turnings.....	5.50 to 6.00
Cast Borings.....	4.50 to 5.00
Mixed Borings, &c.....	4.50 to 5.00
No. 1 Mill.....	6.50 to 7.00
No. 2 Mill.....	5.50 to 6.00
No. 1 Bollers, cut to Sheets and Rings.....	7.00 to 7.50
No. 1 Cast Scrap.....	11.75 to 12.25
Stove Plate and Light Cast Scrap.....	10.00 to 10.50
Railroad Malleable.....	10.25 to 10.75
Agricultural Malleable.....	9.75 to 10.25
Pipes and Flues.....	7.75 to 8.25

The Seneca Wire & Mfg. Company, Fostoria, Ohio, has increased its capitalization from \$100,000 to \$150,000.

## Philadelphia.

PHILADELPHIA, PA., June 10, 1908.

The week's sales in Pig Iron will aggregate a larger tonnage than has been done for some time. The Steel makers have entered the market and placed orders for round tonnages, while the Pipe interests and some of the other foundries have also bought quite heavily. Sales have been for both prompt and forward delivery, and the situation in the Iron market is stronger. Buyers are anticipating their requirements, but sellers in some cases refuse to quote for shipment during the last quarter. The Finished Material market is still unsettled owing to the uncertainty as to prices.

**Pig Iron.**—Buying has been quite heavy, and some sellers have made record sales. The Steel makers have placed orders for some good tonnages for Basic Iron. Sellers have made concessions on this grade, but on the Foundry grades prices have been very firm. Some of the eastern Pennsylvania furnaces have sold Foundry grades quite heavily for New England delivery, and in certain instances a shading of prices was to be noted, but it is understood that some of these furnaces have now obtained all the tonnage they wanted at the price, and have stiffened up materially on quotations. In this immediate territory the tonnage taken by the foundries, outside of the Pipe interests, has not been large, the sales usually ranging from 100 up to 500 tons, mostly for delivery in the next 30 or 60 days, or for shipment in the third quarter. There has been considerable inquiry for delivery the last half of the year and for the fourth quarter, but sellers are not disposed to sell for forward delivery at the same price for which they are willing to do business for delivery in the next month or two. An advance of 50c. to \$1 is generally asked for shipment in the last half of the year, dependent on the tonnage taken, and the delivery date; No. 2X Foundry for prompt shipment being quoted at from \$16.75 to \$17, delivered in this territory. The Steel makers have come into the market quite extensively—not because they needed the Iron, as almost all of them still have large tonnages due them on old contracts, but concessions for prompt Iron on the part of sellers proved interesting, and at the price round lots were taken for early delivery. Total sales of Basic in this vicinity during the week aggregate about 31,000 tons, made up of lots of 15,000, 10,000, and 6000 tons. In several cases the price was confidential, but it is known that \$15.60, delivered, was done for several thousand tons, and that this was shaded somewhat in other cases. From what we can learn, \$15.50, delivered, is about the price at which Basic can be had to-day, but this would likely only be for prompt shipment. Most of the Basic Iron sold recently was for early delivery, but some was for August, September, and October shipment, and delivery on one lot extended over the last half of the year. Low Phosphorus Iron has also been in better demand. The Steel Casting plants are making some inquiry for forward delivery, while a sale of 1000 tons was made for shipment in the last half, at close to \$21, delivered. The Pipe foundries still have inquiries out for large tonnages of low grade Iron. One interest which was in the market for 10,000 tons last week has not yet placed the business. Southern Iron is firmer, and another 50c. advance has been made by some sellers, and \$12 to \$12.50, Birmingham, is apparently the best that can be done for No. 2X Foundry for third quarter delivery, but while some business has been done recently in this territory, no large sales are reported. Forge Iron has been in little demand, a few small sales having been made at ruling prices. Virginia Irons continue to be quite freely sold, mostly, however, for Western delivery, a sale of 1500 tons of Basic and several round lots of No. 2X and 2 Plain at the ruling quotations being reported. The Iron market on the whole shows decided strength. The fact that large tonnages have been taken is looked upon as encouraging, and prices with the exception of Basic Iron have been pretty firmly held. We quote for prompt deliveries in buyers' yards, eastern Pennsylvania and adjoining territory, the following range of prices, but for deliveries during the last half, the majority of sellers ask an advance of from 50c. to \$1 a ton, according to quantity and delivery:

Eastern Pennsylvania, No. 2X Foundry.....	\$16.75 to \$17.00
Eastern Pennsylvania, No. 2 Plain.....	16.25 to 16.50
Virginia, No. 2X Foundry.....	17.00
Virginia, No. 2 Plain.....	16.50 to 16.75
Gray Forge.....	15.25 to 15.50
Basic.....	15.50
Low Phosphorus.....	21.00 to 21.25

**Ferromanganese.**—There seems to be some variance in the prices asked for Ferro for early delivery. Some sellers appear willing to do business on a basis of \$44.50, Baltimore, while others hold at \$46 to \$46.50, seaboard. Transactions are very light, and no orders of any consequence have been reported.

**Steel.**—The demand for Steel Billets is light. What little business has been done has been confined to small lots for prompt shipments. Buyers will not anticipate requirements, particularly when there is some uncertainty regarding prices.



**Plates.**—The demand has not been large. Orders placed are mostly for small lots for prompt shipment. Some inquiries for moderate tonnages are being received, but there is little disposition to place contracts or any heavy tonnages until the matter of prices is definitely settled.

**Structural Material.**—The uncertainty regarding prices has caused a temporary withholding of some business, particularly where any large tonnage was involved. Small and miscellaneous business for prompt shipment, however, comes out quite freely, and the aggregate volume of business keeps up fairly well.

**Sheets.**—The demand continues to show a little improvement, and some of the local mills hold the gains in production recently made, a number now operating at about 75 per cent. of their capacity. Orders are mostly small, and for prompt shipments, stocks in buyers' hands being light. Under existing conditions, however, buyers will not contract for forward deliveries. Prices are unchanged. For mill shipments quotations range as follows, with a tenth extra for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

**Bars.**—The market has been decidedly unsettled owing to the recent cut in the price of Steel Bars. Buyers hold off until they can see just what move will be made in reference to prices by the Eastern mills. The Eastern Bar Iron Association will hold a meeting to-morrow, at which it is generally believed that the base price will be made 1.35c. Pittsburgh, equal to 1.50c. delivered in this territory. It is questionable, however, whether this will meet the situation as iron bars are still being sold in this territory at 1.40c. delivered, and, unless more business applying on old contracts comes out, the low prices will continue to prevail, at least for a time. Some of the Eastern mills, it is reported, have not held to the agreed price, but have made sales at much lower figures. At the time quotations are largely nominal, but Iron Bars have been sold at 1.40c. to 1.45c. delivered. Steel Bars are in light demand, 1.55c. delivered, being quoted for this territory, with Rolled Bars at 1.50c.

**Coke.**—No particular change is to be noted in the demand for Coke. Some small contracts have been made for Foundry Coke, at \$2.40 at oven. Makers of some of the better grades are firmer in their prices for Foundry Coke for forward delivery, although some brands can still be had for prompt delivery at low figures. Furnace Coke has not been active, and quotations are unchanged at \$1.50 to \$1.75 at oven. Foundry Coke is quoted at \$2.25 to \$2.45 at oven. For delivery in this territory the following range of prices is named:

Connellsville Furnace Coke.....	\$3.65 to \$3.90
Foundry Coke.....	4.40 to 4.60
Mountain Furnace Coke.....	3.25 to 3.50
Foundry Coke.....	4.00 to 4.20

**Old Material.**—The market has been quiet, with no quotable change in prices. Steel Scrap is not in as active demand, the mills which bought recently now having about all the tonnage they want. Sales of small lots of Borings and Turnings are reported, but little attention has been given to the general list. Quotations are largely nominal, and range about as follows for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby territory:

No. 1 Steel Scrap and Crops.....	\$13.00 to \$13.50
Low Phosphorus.....	17.50 to 18.00
Old Steel Axles.....	18.00 to 18.50
Old Iron Axles.....	20.00 to 21.00
Old Iron Rails.....	18.00 to 18.50
Old Car Wheels.....	14.00 to 15.00
Choice No. 1 R. R. Wrought.....	15.00 to 15.50
Machinery Cast.....	14.50 to 15.00
Railroad Malleable.....	11.75 to 12.25
Wrought Iron Pipe.....	11.50 to 12.00
No. 1 Forge Fire Scrap.....	11.50 to 12.00
No. 2 Light Iron.....	9.00 to 10.00
Wrought Turnings.....	9.50 to 10.00
Stove Plate.....	11.00 to 11.50
Cast Borings.....	8.50 to 9.00
Grate Bars.....	11.75 to 12.25

## St. Louis.

St. Louis, Mo., June 8, 1908.

Speaking broadly, there is a slow, but steady improvement going on in the Iron interests of St. Louis, the gain being most marked with the makers and consumers of Pig Iron. The metal interests, more especially Zinc producers, complain of unevenness in the demand. The demand for Spelter is good, especially for the production of white lead, as the paint manufacturers find trade very active. Structural Material is doing better, and the branch of the Carnegie Steel Company reports May as a good month for business in this line, Light Rails and track material. The reduction in Bar Steel has induced more liberal buying. Plates and Sheets are dull. A feature is the matter of immediate delivery on orders, as against a delay of often three months last season. Tubes and Pipe continue quiet. The demand for Pig Lead is not steady. High water at this point has caused some uneasiness at East St. Louis, the river having reached the danger line of 30 ft., but the crest

is passing and in three or four days there will be a recession.

**Coke.**—There is no material change in Coke except that shipments are coming forward somewhat faster on contracts. The demand is fair, with some price inquiries pending. Market quotations on Connellsville and Virginia Coke remain about the same.

**Pig Iron.**—A local company has just sold another lot of 5000 tons of Basic, for shipment over the last four or five months, to one of the largest Steel foundries in St. Louis. The price is not given, but is stated to have been higher than last sales made. One inquiry is pending for 2000 tons of Nos. 3 and 4 Foundry for shipment over last half. The order for 2000 tons for delivery over first half of next year has not as yet been placed. Inquiries are plentiful and numerous orders are being booked, ranging from one car up to between 200 and 300 tons, mostly for shipment during third quarter, but sometimes covering all the last half. Prices are firm at \$12, Birmingham, for No. 2, covering third quarter, with usually an advance of 50c. per ton asked for last quarter shipment.

**Spelter.**—The market is firm at 4.50c., with more buyers than sellers at that figure.

**Finished Iron and Steel.**—Floods and prolonged rains have been general in the Southwest, and in consequence the demand has been somewhat affected, particularly from railroads. With settled weather a marked improvement is anticipated. Outside inquiries for Structural Material are rather light, but there is an active demand in small orders from city contractors. There is considerable business in sight. The recent reduction in Bars has brought about considerable increase in activity. The demand for Light Rails from coal and lumber interests holds up well, but the inquiry for Standard Rails remains small. In other track material—Spikes, Splice Bars, &c., a good run of orders is being received.

**Cast Iron Pipe.**—While there is little doing with railroads, there is a fair demand for Pipe for municipal water works.

**Old Materials.**—There being a lack of business with mills, there is practically a dealers' market prevailing. Lists are expected from various railroads the coming week. We hear of no large sales. In some circles it is thought the mills are awaiting the new wage schedule soon to be promulgated by the Amalgamated Association. We quote, per gross ton, f.o.b. St. Louis, as follows:

Old Iron Rails.....	\$14.00 to \$14.50
Old Steel Rails, rerolling.....	12.25 to 12.50
Old Steel Rails, less than 3 ft.....	12.00 to 12.25
Relaying Rails, standard sections, subject to inspection.....	22.50 to 23.50
Old Car Wheels.....	13.00 to 13.50
Heavy Melting Steel Scrap.....	12.00 to 12.25
Frogs, Switches and Guards, cut apart.....	10.00 to 10.25

The following quotations are per net ton:

Iron Fish Plates.....	12.00 to 12.25
Iron Car Axles.....	16.00 to 16.50
No. 1 Railroad Wrought.....	11.25 to 11.75
No. 2 Railroad Wrought.....	9.50 to 10.00
Railway Springs.....	10.50 to 11.00
Locomotive Tires, smooth.....	10.50 to 11.00
No. 1 Dealers' Forge.....	13.00 to 13.50
Mixed Borings, &c.....	9.50 to 10.00
No. 1 Bolters, cut to Sheets and Rings.....	8.25 to 8.75
No. 1 Cast Scrap.....	10.00 to 10.50
Stove Plate and Light Cast Scrap.....	8.25 to 8.75
Railroad Malleable.....	10.00 to 10.25
Agricultural Malleable.....	8.50 to 9.50
Pipes and Flues.....	8.00 to 8.50

In view of the fact that St. Louis and vicinity produces more Cast Steel for railroad purposes than perhaps any other point, the capacity of the five large manufacturing establishments being 220,000 tons of steel castings per annum, furnishing employment for 9000 to 10,000 men, it will be seen that there must of necessity be a large demand to take so great an output and this is not, at present, the case, though there is more doing than in the spring.

The American Car & Foundry Company state that it expects soon to start the construction of a new wheel foundry, and a new soft foundry. The company has a bill pending in the House of Delegates of the city of St. Louis, providing for the closing of a few disused streets near the site of the proposed new plant.

The Bridge & Beach Mfg. Company, manufacturer of stores, states that it is placing orders for its supply of pig iron for the balance of this year on the basis of present prices, being of the opinion there is little chance for a reduction.

The St. Louis Blast Furnace Company has recently executed a deed of trust for \$300,000 for 20 years at 5 per cent., on a number of parcels of property in South St. Louis, and all the machinery of the plant. The money has been raised to modernize and equip the company's plant with modern machinery, to cost in the neighborhood of \$200,000. The new equipment includes boilers, engines, &c. It will practically double the capacity of the plant.



## Pittsburgh.

PARK BUILDING, June 10, 1908.—(By Telegraph.)

**Pig Iron.**—Opinion is divided as to whether the reduction of 50c., a ton in prices of Ore will have a weakening effect on Pig Iron, but it is not believed that it will, for the reason that prices of Pig Iron have reached such a low point that it practically means that the lower prices on ore have already been discounted. Aside from the deal by which the Shenango Furnace Company will furnish the Page Woven Wire Fence Company its entire supply of Basic Iron for three years, the Pig Iron market has been quiet, and there is not much inquiry. We quote Bessemer Iron at \$16 to \$16.25; Malleable Bessemer, \$15.50; Basic, \$15.25 for third quarter, and \$15.50 to \$16 for fourth quarter; Northern No. 2 Foundry, for delivery over the next two or three months, about \$15, all at Valley furnace, with 90c. freight to Pittsburgh.

**Steel.**—A reduction has been made of \$3 a ton on Billets, and \$2 a ton on Sheet and Tin Bars, effective from June 10. We now quote Bessemer and Open Hearth Billets, 3 $\frac{1}{2}$  in. and larger, up to and including 0.25 carbon, \$25; 0.26 to 0.60 carbon, \$1 extra; over 0.60 carbon, \$2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight or 50c. additional is charged. Sheet and Tin Bars in random lengths are \$27, f.o.b. Pittsburgh.

**Merchant Pipe.**—Reports that the National Tube Company has secured an order from the Standard Oil Company for 1000 miles of line pipe are absolutely untrue.

(By Mail.)

Since last week's cut in prices of Bars orders for other forms of Finished Material have been held up, the trade fully believing that reductions in prices were certain. In the Pig Iron trade it is noteworthy that the Shenango Furnace Company has made a contract with the Page Woven Wire Fence Company, Monessen, Pa., for its entire requirements of Basic Iron for a period of three years. The Page Company operates two 15-ton Open Hearth furnaces, and has just completed the building of a 50-ton furnace, so that its output of Steel runs from 150 to 200 tons a day. The company uses about 50 per cent. of Scrap and will need about 2000 tons of Basic Pig a month, so that it will need in the next three years upward of 75,000 tons of Basic Iron. The Shenango Furnace Company had a similar contract with the Page Company which expired last January, but which was not renewed at that time for the reason that the latter preferred to buy its requirements of Pig Iron in the open market until conditions became more settled. The Shenango Furnace Company also furnishes the entire requirements of Basic Iron to the Sharon Steel Hoop Company, Sharon, Pa., and the Thomas D. West Foundry Company, Sharpsville, Pa. The three contracts aggregate 500 tons a day or more. Aside from the above, very little in Pig Iron has been done in the past week. It is not believed that the reduction of 50c. a ton on Ore will have the effect of causing a decline in prices of Pig Iron, as the reduction has really been anticipated in the low prices that have been ruling on Pig Iron for some time. There is no new demand for Billets, Sheet or Tin Bars, and only a limited tonnage is being taken out on contracts. It is believed that with the pending reductions on Finished Iron and Steel announced, with the Presidential nominations out of the way and the assurances of good crops, there will be a material improvement in demand.

**Structural Material.**—The only local jobs in sight are the First National Bank Building, about 1000 tons, and the Horne Building, about 2500 tons, both of which are expected to be placed in the near future.

**Ferromanganese.**—There is a fair amount of inquiry, but some sellers of Ferro are not inclined to press the market for sales in the belief that possibly prices will be higher in the near future. A local consumer has bought about 50 tons for July and August on the basis of about \$44, at seaboard, or \$45.95, Pittsburgh. We quote foreign 80 per cent. Ferro at \$44.50, seaboard, for third quarter and about \$46, seaboard, for delivery over last quarter. The Pittsburgh Steel Company has been a large buyer of Ferro for its new Steel plant at Monessen, Pa.

**Ferrosilicon.**—We note sales of about 50 tons of 50 per cent. for June and July delivery at \$70, Pittsburgh, and quote the market at that price.

**Muck Bar.**—In the absence of sales on which to base authentic prices, we quote best grades of Muck Bar, made from all Pig Iron, at nominally \$26 a ton, f.o.b. Pittsburgh. Northern Forge Iron is \$14, Valley, or \$14.90, Pittsburgh, and it is claimed it cannot be put into Muck Bar at \$11 a ton and allow a profit. The mills that roll Muck Bar have asked the Amalgamated Association for a reduction of 10 per cent. or more in the Muck Re-rolling scale.

**Skelp.**—No recent sales have been made in this market, and the mills are running only to about 30 or 40 per cent. of capacity. We quote nominally as follows: Grooved Steel

Skelp is 1.55c. to 1.60c.; Sheared Steel Skelp, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.75c. to 1.80c.; Sheared Iron Skelp, 1.85c. to 1.90c., Pittsburgh.

**Rods.**—Any tonnage that might be wanted is being held back until it is known whether there will be a reduction in prices of Wire products, which would naturally carry lower prices for Rods.

**Steel Rails.**—While large tonnage in Standard Sections has been placed, the Carnegie Steel Company has received some fair specifications against contracts and has taken an order for 700 tons of Rails for a lumber interest. The switch and signal companies are buying a few Rails, and this is regarded as a favorable indication. Negotiations are under way for a fairly large tonnage of Rails for export, but nothing is known here as to the report that Russia is in the market for a heavy tonnage for the Siberian railroad, which it is reported will be relaid with heavier sections and double tracked. The demand for Light Rails is fairly active, the Carnegie Steel Company having taken over 2000 tons the past week. Re-Rolled Light Rails have sold as low as \$21 a ton, Pittsburgh. Regular quotations on Light Rails, which are shaded \$4 to \$5 a ton to meet competition of mills that re-roll Rails, are as follows: 25 to 45 lb. Sections, \$28; 20-lb., \$29; 16-lb., \$30, and 12-lb., \$32. We quote Standard Sections at \$28, at mill, and Angle Splice Bars at 1.65c., at mill.

**Plates.**—The demand continues dull and is only for small lots for actual needs. The Steel car builders and the lake boat builders are not buying, while the general trade is taking only such tonnage as it actually needs. Prices continue to be shaded \$2 a ton by a few of the mills, but not enough new business is being placed to test the market.

**Sheets.**—The demand does not show any betterment, the tonnage booked in May showing a decided falling off as compared with April. The American Sheet & Tin Plate Company is operating only about 45 per cent. of its Sheet capacity, and the independent mills are not doing any better. In some cases the prices we give may be slightly shaded by the mills absorbing part of the freight: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c. No. 28 Painted Roofing Sheets, \$1.75 per square, and Galvanized Roofing Sheets, No. 28, \$3.10 per square, for 2 $\frac{1}{2}$ -in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

**Tin Plate.**—The demand is only fairly active, but the mills have a moderate tonnage on their books, against which specifications are coming in quite freely. The American Sheet & Tin Plate Company is operating about 95 per cent. of its Tin Plate capacity, having only two of its large plants idle, these being Morewood and Anderson. Nothing is known here of a reported reduction in prices of Tin Plate, and it is not believed that any will be made, as Tin Plate was reduced 20c. a box in January last, to meet a reduction of \$2 a ton in Tin Bars. We quote at \$3.70 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

**Hoops and Bands.**—As foreshadowed in this report last week, Hoops and Bands have been reduced \$4 a ton, to correspond with a like reduction in Steel Bars. Very little new business is being placed, and specifications against contracts are only fair. Selling agents of the Steel Hoop interests report that the local option movement is so strong in certain sections of the country that it is decidedly cutting down the tonnage needed in Steel Hoops. We quote: Regular prices are as follows: Steel Hoops \$1.80, base, full Hoop card extras; Steel Bands, \$1.40, base, half Steel card extras, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

**Iron and Steel Bars.**—No settlement of the puddling and finishing scales was reached at the conference between the Western Bar Iron Association and the Amalgamated Association, held at Cambridge Springs, Pa., last week. The manufacturers asked for a reduction of 10 per cent. or more in puddling and finishing mills, basing this on the recent reductions in prices of Iron and Steel Bars. No time was set for another conference, but one will likely be held between now and June 30, when the present scales expire. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

**Spelter.**—The market continues dull and prices are weak. We quote prime grades of Western Spelter at about 4.30c., East St. Louis, equal to 4.42 $\frac{1}{2}$ c., Pittsburgh.

**Railroad Spikes.**—A fair amount of new tonnage in

small lots is being placed for the smaller sizes, but the demand for standard sizes is practically stagnant. We quote: Standard sizes, 4½ x 9-16 in., at \$1.70, and the smaller sizes at \$1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

**Merchant Pipe.**—New business is showing a small but gradual increase, May having been about 10 per cent. larger than April, and the outlook for June is fair.

**Boiler Tubes.**—Very little new business in Locomotive Tubes is being placed by the railroads, while the demand for Merchant Tubes among the general trade is only fair and is mostly for small lots for actual needs. Prices are somewhat uneven, regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, are as follows:

Boiler Tubes.		
	Iron.	Steel.
1 to 1½ in.	42	47
1½ to 2¼ in.	42	59
2¼ in.	47	61
2½ to 5 in.	52	65
6 to 13 in.	42	59
2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
2½ in. and larger, over 22 ft. long, 10 per cent. net extra.		

**Iron and Steel Scrap.**—Some inquiry is in the market for Low Phosphorus Melting Stock, but the general Scrap trade is quiet, and prices are only fairly strong. Dealers quote about as follows, per gross ton: Heavy Steel Scrap, Pittsburgh, Steubenville or Sharon delivery, \$13 to \$13.25; Cast Borings, \$7.25 to \$7.50; No. 1 Railroad Wrought, \$13.25 to \$13.50; No. 1 Cast, \$13.75 to \$14; Bundled Sheet Scrap, \$8.50 to \$9, at shipping point; Sheet Bar Crop Ends, \$16 to \$16.50; No. 1 Busheling Scrap, \$12 to \$12.25; No. 2, \$9 to \$9.25; Iron Axles, \$19 to \$19.50; Steel Axles, \$16.50 to \$17; Low Phosphorus Melting Stock, \$17 to \$17.50; Old Steel Rails, short pieces for Open Hearth use, \$12.75 to \$13; Rerolling Rails, lower in price, \$13.50 to \$13.75; Machine Shop Turnings, \$8 to \$8.25; Grate Bars, \$12 to \$12.50; Railroad Malleable Scrap, \$11.25 to \$12.

**Coke.**—As noted last week, there is a little more inquiry for Furnace and Foundry Coke, and few more ovens in the Connellsville region have been started up. As yet prices have not shown much betterment, and we continue to quote Connellsville Furnace Coke for prompt shipment at \$1.50 to \$1.60, and 72-hr. Connellsville Foundry Coke at \$2 to \$2.25, at oven. The output of Coke last week in the Upper and Lower Connellsville regions was about 175,000 tons, a gain of about 5000 tons over the previous week.

## Cleveland.

CLEVELAND, OHIO, June 9, 1908.

**Iron Ore.**—Sales of 1908 Ore aggregating 125,000 tons have been made by merchant Ore firms the past week. With the exception of a few small lots amounting to about 25,000 tons, sold several weeks ago, this is all the Ore that has been sold so far this season. Furnacemen, however, are taking more interest in the market than they have for some time, and it is believed that a fairly active buying movement will develop within the next two weeks. All sales have been made at the established prices, which, so far, are being firmly maintained by the Ore firms. The Ore shipments from the upper lake ports in May, being the total for this season, were only 285,315 tons, as compared with 6,252,261 tons up to June 1, 1907. Shipments have increased only slightly so far this month, and it is not believed that the June movement will exceed 2,000,000 tons. Most of the Ore that is coming down is being sent forward to the furnaces, but the shippers are having trouble in getting shipping orders. The movement of last year's Ore from the docks is still very light, and the dock piles have been reduced but little since May 1. The small tonnage of Ore that has been sold does not warrant the starting of any more boats, and three of the leading Ore interests that have not shipped a ton of Ore are as yet making no preparations for starting their boats, and it is not expected that they will make a general start before July 1. The merchant Ore interests are holding a meeting to consider the price question again, but no action has thus far been taken.

**Pig Iron.**—The market has quieted down after the recent heavy buying movement, and no new inquiries of any size are appearing. Considerable tonnage of Foundry Iron, however, was sold late last week by three furnace interests on inquiries that came out in the latter part of the buying movement. A local furnace sold 1000 tons to a northern Ohio foundry for June delivery, and reports the sale of 12,000 tons of Foundry Iron during the recent buying movement, mostly to consumers in this territory, for third quarter delivery. While some No. 2 Foundry Iron is reported sold at \$14.50, Valley furnace, yet \$15, Valley furnace, seems to be the minimum price with some of the furnace interests, and the most of the sales have been made at that price. The majority of Valley furnaces are now holding pretty firmly to \$15.25 to \$15.50 for third quarter and last half delivery, for

No. 2. Local furnaces are asking \$15.75 to \$16, at furnace, for delivery in this territory. The majority of the consumers have covered for a portion of their requirements for the last half and producers believe that the market has settled down to another quiet spell. With Northern Iron cheaper than Southern there is very little inquiry for the latter. A local Basic interest is holding its price at \$16, at furnace, but reports no sales or further inquiries. The Bessemer Iron market is still quiet, there being no inquiries. The melt of Foundry Iron in this territory shows no particular improvement. Some of the furnace interests that have large stock piles of Foundry Iron announce their intention to hold their product for better prices. For prompt shipment and for third quarter we quote, delivered, Cleveland, as follows:

Bessemer	.....	\$16.90
Northern Foundry, No. 1	.....	\$16.25 to 16.75
Northern Foundry, No. 2	.....	15.90 to 16.25
Northern Foundry, No. 3	.....	15.50 to 15.90
Southern Foundry, No. 2	.....	16.35 to 16.85
Gray Forge	.....	14.90

**Coke.**—While there is not a great deal of activity, the market continues firm. Some furnace interests that expect to put their furnaces in blast later in the year have covered the past week for their last half requirements. We quote Connellsville Furnace Coke at \$1.75 to \$1.85, at oven. High grade 72-hr. Foundry Coke is quoted at \$2.25, at oven, for last half delivery. Some interests are asking slightly higher prices.

**Finished Iron and Steel.**—While a little more activity has been aroused in the market by the reductions in prices of Iron and Steel Bars, the improvement in the actual demand is not very large. Several of the agricultural implement makers have closed contracts for their Steel Bar requirements for the year ending July 1, 1909, at the new price of 1.40c., Pittsburgh, and others are expected to make contracts in the next few days. The implement manufacturers, as a rule, are contracting for about the same tonnage as last year. Some other consumers have also taken advantage of the lower prices and closed contracts for Steel Bars for delivery until October 1, when their specifications must be in, according to the price reduction agreement. Some of these consumers are offering to make contracts providing that they be allowed until January 1 to specify, and it is rumored that some mills are making this concession. Specifications for Steel Bars have come in a little more freely, but as the actual consumption has not materially improved, the lower prices are not expected to improve conditions very much. The reduction in the price of Bar Iron has had somewhat of a stimulating effect, and some orders and specifications have come in at the new price of 1.35c., Pittsburgh. Local Bar mills that have been running barely half the time for several months have enough orders on hand to keep them running the balance of the month. While implement makers are contracting for Steel Bars they are not placing contracts for Steel Specialties, of which their requirements for making implements are large, but are holding off with the expectation of getting lower prices. Because of the reduction in Bars, consumers of Structural Material and Plates are looking for lower prices in these lines and the demand is lighter. A reduction of \$4 a ton has been made in Chain Rods. We quote Iron Bars at 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras. Dealers quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers have slightly reduced their warehouse price on Iron and Steel Bars, which we now quote out of stock at 1.65c. to 1.70c. Owing to the reduction of \$4 a ton on Hoops, the stock price has been reduced from 2.50c. to 2.30c. Other store prices remain unchanged. Beams and Channels out of stock are 2.10c. to 2.15c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.85c. Warehouse prices on Boiler Tubes, 2½ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

**Old Material.**—Steel Scrap is still firm and there is considerable activity among dealers to cover on contracts made about two weeks ago with the American Steel Foundries. For this Scrap, for which specifications are rather severe, dealers are paying \$13.25 to \$13.75, delivered at Alliance. Yard dealers, as a rule, have good stocks of Steel Scrap on hand, but are unwilling to sell at present prices. There is some improvement in the demand for Busheling Scrap and Borings and Turnings from outside mills. Local Rolling Mills are buying some Scrap in small lots. Among the railroad offerings this week is a Baltimore & Ohio list of about 3000 tons and a Norfolk & Western list of 1000 tons. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	.....	\$12.50 to \$13.00
Old Iron Rails	.....	14.50 to 15.50
Steel Car Axles	.....	16.00 to 17.00
Old Car Wheels	.....	12.50 to 13.00
Relaying Rails, 50 lb. and over	.....	21.00 to 22.00
Heavy Melting Steel	.....	12.00 to 12.50
Railroad Malleable	.....	11.50 to 12.00
Agricultural Malleable	.....	10.50 to 11.00
Light Bundled Sheet Scrap	.....	7.50 to 8.50



The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$16.00 to \$16.50
Cast Borings.....	5.00 to 5.50
Iron and Steel Turnings and Drillings..	6.00 to 6.25
Steel Axle Turnings.....	7.50 to 8.00
No. 1 Rusheling.....	10.50 to 11.00
No. 1 Railroad Wrought.....	11.50 to 12.50
No. 1 Cast.....	11.00 to 11.50
Stove Plate.....	9.50 to 10.00
Bundled Tin Scrap.....	8.00 to 9.00

## Cincinnati.

CINCINNATI, OHIO, June 10, 1908.—(By Telegraph.)

The various agencies report some good sales on the new basis of \$12, Birmingham, for Southern No. 2, while it is reported that one Northern interest has taken considerable business in Foundry grades at a shade below the published market price of \$15.50, Ironton furnace. There has been some further buying of Bessemer, Malleable and Basic Iron in this territory, and sellers are deriving some encouragement from the fact that manufacturers of railroad equipment are feeling the market cautiously for Iron and some are out with specifications. There is much confusion among the jobbers of Iron and Steel finished products over the announced reductions, and the report here this afternoon of the general drop on all lines save Steel Rails, Sheets and Tin Plates, has added to the discussion. The move has not the indorsement of any large local selling interests, who aver that nothing is gained and much may be lost. No material improvement is shown in the local machine tool market, although some representatives of large tool producing establishments in other sections claim to have made some good sales here during the week.

**Pig Iron.**—Attention seems to have been diverted for a time from the Southern situation to the Northern product, which is considerably more of a factor this week among consumers than it was last week in the Cincinnati market. A sale to a local melter of between 1500 and 2000 tons of Bessemer is accredited to a central Ohio interest at a price unattractive to local agencies. Scarcity of low grades is still as pronounced as ever. A small tonnage of Mottled brought \$10.50, Birmingham, and there is very little Forge or No. 4 to be had in the South. Southern Iron is held firmly at \$12, Birmingham, for No. 2, and some furnaces are asking \$12.50 for third quarter, with the prohibitive price of \$13 for last quarter. The Pipe companies are nearly all in the market with inquiries which, however, give but little indication of their respective needs, as all purchases are guarded more carefully on a market of the present peculiar character. The foundry melt is increasing slowly, and some local melters have come into the market during the week for a portion of their requirements as far ahead as they can cover at the prevailing price, but so far as can be learned no figures have been secured for any part of next year. A number of Malleable concerns have bought during the week at close to \$15.50, Ohio furnaces. A large manufacturer of harvesting machinery is asking for 6000 to 7000 tons for early delivery. A central Ohio car manufacturing concern is expected to close at once for 5000 tons of Foundry Iron and some Malleable. Another concern making railroad supplies wants 2000 tons of No. 2 and 3 Foundry, both Northern and Southern, for the last half. Ohio Silveries, 8 per cent. Silicon, are still quotable at \$18.50, at furnace, for early delivery. To the close of the third quarter we quote f.o.b. Cincinnati, as follows, freight rates being \$3.25 from Birmingham and \$1.20 from the Hanging Rock District:

Southern Coke, No. 1.....	\$15.75 to \$16.25
Southern Coke, No. 2.....	15.25 to 15.75
Southern Coke, No. 3.....	14.75 to 15.25
Southern Coke, No. 4.....	14.25 to 14.75
Southern Coke, No. 1 Soft.....	15.75 to 16.25
Southern Coke, No. 2 Soft.....	15.25 to 15.75
Southern Coke, Gray Forge.....	13.75 to 14.25
Ohio Silvery, 8 per cent. Silicon.....	19.70
Lake Superior Coke, No. 1.....	16.95 to 17.45
Lake Superior Coke, No. 2.....	16.45 to 16.95
Lake Superior Coke, No. 3.....	15.95 to 16.45
Standard Southern Car Wheel.....	22.25 to 22.75
Lake Superior Car Wheel.....	22.00 to 22.50

(By Mail.)

**Coke.**—There has been some business placed in both Furnace and Foundry grades, but not what might be expected if the buying of Pig Iron had indicated permanency. As it is, the bulk of those needing Coke came into the market at once and early requirements have about been filled. Some contracting is being done on Furnace Coke for the last half and also for Foundry grades for the last half and for the year beginning July 1. Connellsville 72-hr. Foundry is quotable at about \$2.10, minimum, for spot Coke and at \$2.25 to \$2.45 on contract. Furnace Coke has slumped off somewhat, but prices are unchanged. One effect of the buying movement was to remove all the low priced lots. There is no perceptible increase in production.

**Finished Iron and Steel.**—Almost as a unit, dealers declare that there will be no reductions ordered on store lots of Finished Material. Some months ago the larger factors entered into a sort of tentative clearing house arrangement, and there was a more or less mutual reduction of stocks, an-

tipicating some such move as the reduction in Bars. The consensus of opinion here is that the price reductions were ill advised, and the dealers go further and announce that their customers are also sorry that they were made. With all this, there seems to be a better feeling and there have been some fairly good sales of Iron Bars. Orders from stock are still filled at the following prices, which are f.o.b. Cincinnati: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras. Steel Plates, carload lots, 1.75c., base, half extras; small lots from store, 1.85c., base, half extras. Base Angles, carload lots, 1.85c. base; small lots from store, 2.10c. Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c. Plates, ¼ in. and heavier, carload lots, 1.85c.; small lots from store, 2c. Blue Annealed Sheets (Heavy), No. 16, carload lots, 2.15c.; small lots from store, 2.50c. No. 14, carload lots, 2.05c.; small lots from store, 2.40c. No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c. No. 12, carload lots, 2c.; small lots from store, 2.30c. Sheets (Light), Black, No. 28, carload lots, 2.65c. Galvanized Sheets, No. 28, carload lots, 3.70c. Steel Tire, 4-in. and heavier, carload lots, 1.95c. Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

**Old Materials.**—The feature of the Scrap market for the week has probably been the billing of several thousand tons of Cast Scrap to interior points where dealers seem to have been short on that line. One shipment of 2000 tons went to Cleveland for foundries and Steel mills. Some more Melting Steel Scrap has been shipped to Europe. Local dealers are somewhat apprehensive of some Chicago and Western dealers who are loaded up with Scrap of all kinds, and who, it is reported, are getting ready to unload it at reductions, if necessary, to move it. The following prices are as nearly representative of this market as possible to obtain and are f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton.....	\$10.50 to \$11.50
Cast Borings, net ton.....	4.00 to 5.00
Heavy Melting Steel Scrap.....	11.00 to 12.00
Steel Turnings, net ton.....	5.00 to 6.00
No. 1 Cast Scrap, net ton.....	10.25 to 11.25
Burnt Cast and Wrought, net ton.....	8.00 to 9.00
Old Iron Axles, net ton.....	14.50 to 15.50
Old Iron Rails, gross ton.....	13.00 to 14.00
Old Steel Rails, long, gross ton.....	11.00 to 12.00
Old Steel Rails, short, gross ton.....	11.00 to 12.00
Relaying Rails, 56 lb. and up, gross ton.....	22.00 to 23.00
Old Car Wheels, gross ton.....	12.00 to 13.00
Low Phosphorus Scrap, gross ton.....	13.00 to 14.00

## Birmingham.

BIRMINGHAM, ALA., June 8, 1908.

**Pig Iron.**—The market is not so active as at the time of last report, but producers are apparently satisfied with the situation as presented and quotations have not weakened. Three of the smaller makers are now practically out of the market for the third quarter and have advanced quotations to \$12.50, Birmingham. Leading interests are making preparations to increase their output, but their attitude as to engagements for delivery beyond the third quarter has not changed and indicates that an increased rate of production is warranted by order book requirements. It has developed that a significant proportion of large tonnages recently engaged is for delivery covering the remainder of the year. The schedule of \$12, Birmingham, for No. 2 Foundry is being adhered to for prompt deliveries and the third quarter, and could hardly be shaded. A basis of \$12.50 is considered market price for the last quarter, and delivery covering the last half of the year could probably be had at figures slightly under this basis. A favorite brand of High Manganese Iron is being held at \$13, Birmingham, for No. 2 Foundry. Recent transactions have involved comparatively small lots and negotiations have been by melters direct, but, with the exception of Cast Iron Pipe, there is still no tangible evidence of a material improvement in the foundry trade. Among the sales reported within the past week 600 tons of No. 2 Foundry for delivery within three months is most significant. This lot was sold at \$12, Birmingham, and 250 tons for the third quarter brought the same price. The sale of 100 tons of 2.25 per cent. Silicon Iron is reported at \$12.75 per ton, Birmingham. The principal inquiry known to be pending is from an Ohio melter for 2000 tons, but the aggregate of smaller lots furnishes an encouraging outlook. The scarcity of off grade Iron continues, and in some cases producers refuse quotations.

**Cast Iron Pipe.**—The principal contract awarded within the week was 1600 tons of Water Pipe for the city of Louisville, Ky. This tonnage was awarded the Dimmick Pipe Company, but the price to be paid has not been made public. A number of comparatively small lots have recently been placed at exceptional prices, but transactions were of such a nature as not to determine definitely the status of the market. It is reported on good authority that the tonnage recently awarded the United States Cast Iron Pipe & Foundry Company for Syracuse, N. Y., will be furnished from Buffalo, which would mean a net price of \$21.80 per ton to the producer. The result of bids on contracts for Cuban points and Council Bluffs, Iowa, is being awaited with much



interest by Southern concerns. We quote the following for Water Pipe per net ton, f.o.b. cars here: 4 to 6 in., \$23; 8 to 12 in., \$22; over 12-in., average \$21, with \$1 per ton extra for Gas Pipe. These quotations are probably shaded on large municipal contracts.

**Old Material.**—A better feeling prevails with all parties concerned in the market, but the volume of business transacted has not increased. Purchasers are apparently unwilling to cover for anticipated requirements, with dealers indisposed to force a market by making concession in prices. The sales reported indicate a maintenance of prices, and we quote as follows, per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$15.00 to \$15.50
Old Iron Axles.....	14.00 to 15.00
Old Steel Axles.....	12.50 to 13.00
No. 1 Railroad Wrought.....	12.00 to 12.50
No. 2 Railroad Wrought.....	9.00 to 9.50
No. 1 Country Wrought.....	10.50 to 11.00
No. 2 Country Wrought.....	9.50 to 10.00
Wrought Pipe and Flues.....	8.50 to 9.00
No. 1 Steel.....	9.50 to 10.00
No. 1 Machinery.....	9.50 to 10.00
Stove Plate and Light Cast.....	8.50 to 9.00
Cast Borings.....	5.00 to 5.50

## The German Iron Market.

BERLIN, May 28, 1908.—The ebb tide in the Iron industry continues, and no signs of a change are as yet apparent. The rate of production and distribution is lower from month to month. The make of Pig Iron had kept up remarkably well to the end of March, considering the pronounced weakening of the general situation; but with April production began to shrink at an accelerated pace. The production for the month reached only 979,866 metric tons, which means a drop of 67,000 tons as compared with March, and not less than 98,000 tons, as against April, 1907. With the exception of the Februaries, last month was the first time that the monthly output dropped below 1,000,000 tons for nearly two and a half years.

### Influence of Gas Engines on Pig Iron Production.

The explanation of why the rate of Iron production kept up so long after the high tide of prosperity had been passed is to be found largely in the use of the furnace gases in gas engines. As the gases were needed for creating power, furnaces were in many cases kept running without respect to the actual demand for Iron. The consequence is that considerable stocks have been accumulated at the furnaces, beyond the immediate demands of the market. Conditions, however, have grown worse and worse, and the blowing out of furnaces is now reported more frequently than several months ago. Hence it is certain that the rate of Pig Iron production will continue to shrink.

Owing to the large volume of supplies at the furnaces, consumers refuse to place orders for long terms, knowing that they can have all the Iron they need at any time and upon the shortest notice. They are, therefore, only buying hand-to-mouth quantities. Owing to the situation here described, unusual competition among the five Pig Iron syndicates of the country is reported, while considerable English Iron still finds its way into Germany, the price being 70 to 72 marks for No. 3 Foundry. Spiegeleisen is now quoted at 82 to 85 marks, Puddling at 74, Thomas at 65, Luxemburg Puddling at 52 to 53, German No. 1 Foundry at 76, No. 3 at 71, Luxemburg Foundry at 54, German Bessemer at 80. It will be noted that some of these prices are still pretty high.

### Dissatisfaction with Pig Iron Syndicates.

Much dissatisfaction prevails in some sections of the trade over the course of the Duesseldorf Syndicate in keeping prices higher than the state of trade warrants. This dissatisfaction has found expression particularly in the Siegerland Syndicate, which is to all intents and purposes an annex to the Duesseldorf organization. In the Siegerland region, which is the chief producing center for Spiegeleisen and some other high grade qualities, the furnaces are only running upon a 50 per cent. basis of production, but their orders are only 30 per cent. of their producing capacity. Furnacemen there complain bitterly that prices are kept up so high as to check sales and they are threatening not to continue the arrangement with the Duesseldorf Syndicate after the end of the year, when it expires.

At the same time the feeling has spread among furnacemen in various sections of the trade that the present splitting up of the furnaces into five separate syndicates is not advantageous. At a preliminary informal conference on the subject several days ago, some important producers flatly declared that they were not going to remain in their syndicates under the existing circumstances. They demanded that all the furnaces in the western part of the empire get together in one common organization. While the idea of a single combination has been received with much favor, cool observers regard the prospects for any organization whatever as rather doubtful. The chief difficulty appears to be found in the new furnaces now springing up on the seacoast. These have the advantages of cheap foreign Ores and Coke

and the proximity of large districts where no Iron is produced; hence they will demand that big allotments be guaranteed to them as a condition for joining any combination.

### The Steel Works Association.

The April shipments of the Steel Works Association were the lightest since the combination was organized, with the single exception of last December. The total movement for the month was only 371,956 metric tons, against 486,468 tons in March, and 481,974 tons in April, 1907. The shrinkage was chiefly in Steel Rails and Ties, which had hitherto kept up their rate of production better than any other section of class A goods. As compared with March, the drop in this specialty was 57,700 tons, and as compared with the high water mark touched last November it was 81,000 tons. The shipments of Billets were 104,703 tons, which is about 28,000 tons less than in March, but somewhat more than in January and December. Structural Steel was shipped to the amount of 126,125 tons, which is a reduction of 29,300 tons from March, but considerably more than for any one of the four preceding months.

It is a significant fact that the association's usual report has this time been cut down to narrow limits. It says in respect to Billets that consumers are holding back and buying only the most necessary amounts of Steel, and that it is consequently difficult to say anything about the demands for the next few months. In Structural Steel, too, the report says that consumers are holding off, inasmuch as building activity is not brisk. In the Heavy Rail section, says the report, the contracts with the various domestic railroads have now been concluded, and some contracts for Grooved Rails have been taken. It is hopefully mentioned that quite a number of projects for street and branch railroads are under negotiation, and are only held up pending an improvement in the money market. Some foreign contracts have also been arranged, but sharp competition prevails in neutral markets. The passage of a bill by the Reichstag for building railroads in the German colonies opens the prospect of considerable orders for Rails and Ties, and these will probably extend over a number of years.

### The Small Rolling Mills.

The weakest section of the Iron industry continues to be that of the unattached rolling mills, which are under the necessity of buying their Steel from the great works of the association. The latter has maintained prices at a very high level, at the same time that it has been pushing its export trade by making heavy price cuts on foreign orders. The *Cologne Gazette*, which gives close attention to matters affecting the Iron trade, says that German Muck Bars and Billets are sold laid down in Glasgow at 80 marks, while the home consumer has to pay 100 to 102.50 marks per ton; also that German Wire Rods are put on board at Antwerp and Rotterdam at 100 marks, whereas the price in the home market is 132.50 marks. This policy, it says, of favoring the foreigner at the expense of the home manufacturer of finished goods must result in ruining the latter, the span between home and export prices being so great that it cannot be compensated for by the drawback guaranteed by the trade organizations on exported finished goods.

These unattached rolling mills are feeling the pinch and are also casting about for a remedy. Recently some 30 representatives of such concerns met a dozen members of the Reichstag here at Berlin for a conference on their dilemma. These members were from nearly every political party, and at their suggestion it was decided to petition the Imperial Government to pass a law abolishing the protective duties on Pig Iron and Billets. It has been intimated in the press that the representatives of these mills have received evidences of sympathy from the Government. Under the circumstances it seems probable that an effort will be made next winter to abolish the duties mentioned. The members of the Reichstag who attended the conference assured the Iron men that such a bill could easily be passed.

Efforts have been in progress for some time to organize the manufacturers of Plates and Sheets. The plan was to create two organizations, one for thin and one for heavy goods. The negotiations for the former had reached such an advanced state that a final meeting was held several days ago to complete the organization, but one important mill in Lorraine and one or two smaller concerns refused to enter it and the whole plan was abandoned. This also means the failure to organize in Heavy Plates.

Reports that the Republic Iron & Steel Company would build a three high 38 in. blooming mill at its Bessemer steel plant, Youngstown, Ohio, are untrue. The company recently added an extra stand to the train on which tin bars are rolled, but aside from this no improvements or additions at the plant are under way or contemplated.

The sheet bar mill and 10 hot mills in the McKeesport Works of the American Sheet & Tin Plate Company, McKeesport, Pa., are scheduled to start up June 15.

## New York.

NEW YORK, June 10, 1908.

**Pig Iron.**—Sharp competition between furnacemen in eastern Pennsylvania has led to a demoralized market both in this district and in New England, and quite a considerable tonnage has been booked, chiefly of Foundry Iron, at a wide range of prices. During the week \$16.50 has been freely done at New England points for No. 2 Foundry, and in this market \$15.50 to \$16 for the same is quoted. At the close the eagerness to book business seems to continue. We quote at tidewater, Northern No. 1 Foundry, \$16.50 to \$17; No. 2 Foundry, \$15.50 to \$16, and No. 2 Plain, \$15 to \$15.50. Alabama Irons are quoted at \$16.75 to \$17 for No. 1, and \$16.25 to \$16.75 for No. 2 Foundry, so that Southern Irons are now considerably above local Irons.

**Structural Material.**—The placing of contracts for buildings and bridges has undoubtedly been checked to a considerable extent by the general belief that a reduction in prices of Structural Material would shortly be made. A great deal of business is pending, and as the uncertainty surrounding the market is now relieved the negotiations may be expected to result in orders speedily. The Pennsylvania Railroad Company has at last begun to purchase material for viaducts over its car storage yards on Long Island, having placed one order for 1500 tons with the Pennsylvania Steel Company for this purpose. The Hamburg-American Company is negotiating for 1500 tons for a new pier at Hoboken, N. J. The Public Service Corporation of New Jersey and the New York City Railway Company are expected to place orders for buildings taking about 500 tons. These are only a few of the orders now in sight. It is claimed that although the price of Structural Material has been reduced the fabricators will not make lower prices on bridges and buildings than they have been doing, as they had been anticipating this lower cost of their material. The demand for plain material has naturally been quiet also. We quote on tidewater deliveries, shipments from mill, as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Material cut to length is sold from stock at 2¼c. to 2½c.

**Ferroalloys.**—More inquiries are in the market, but these are mostly for small lots. Some 80 per cent. Ferromanganese has been sold at about \$43.50 Baltimore. Some foreign makers claim this price is below cost and their agents are holding for higher prices. No change is noted in 50 per cent. Ferrosilicon, which is held at \$70 Pittsburgh.

**Bars.**—The lower prices made on Steel and Iron Bars have brought out considerable buying, and the volume of business has been quite large in the past week. Quotations on Bar Iron have improved slightly, and it is understood that 1.40c. New York is the bottom price to be secured now. Quite a number of the Eastern mills are making their minimum 1.40c. at mill. A meeting of the Eastern Bar Iron manufacturers is being held to-day for the purpose of endeavoring to effect some arrangement which will put business in better condition. Steel bars are quoted at 1.40c. Pittsburgh, or 1.56c. New York.

**Plates.**—The local demand continues to be confined to small lots. Prices of standard sizes of Plates are now as follows, at tidewater: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Fire Box Plates, 2.65c. to 3.50c., according to specifications.

**Cast Iron Pipe.**—The city of Worcester, Mass., which purchased 1000 tons of Pipe in February, is about to contract for 1000 tons more of 14 and 16 in. The city of New York will to-day open bids for 3500 tons, and the city of Rome, N. Y., for 3745 tons, as stated in last week's report. It is believed that the bids on these lots will be somewhat higher than those named at recent lettings, as the foundries are getting well filled on large Pipe and are therefore feeling rather more independent. There is further a better carload inquiry and more actual placing of orders. Manufacturers are asking a slightly higher price on carload lots of 6 in. at tidewater, and the inside figure is now said to be \$24.50 per net ton.

**Steel Castings.**—Bids were opened May 25 by the New York Dock Department on 172,000 lb. of Cast Steel Mooring Ports, with anchor blocks and washers, on which the price ranged from 2.78c. to 3.67c. per lb. The following were the bids: Foster F. Booth, Dover Boiler Works, \$5900; J. K. Larkin, \$4834.93; Hobson, Halliday & Co., \$5100; Motley, Green & Co., \$6320; Maryland Steel Company, \$5263; J. Shewan & Son, \$4789; New Jersey Foundry & Machine Company, \$5382; Griscom-Spencer Company, \$5867; J. Edward Oden Company, \$4786.03; Mesta Machine Company, \$6020; G. & W. Mfg. Company, \$5543.

**Old Material.**—The cut in prices of Steel and Iron Bars has had a rather depressing influence on the Scrap market, and it has further not been helped by the expectation of lower prices on other Finished products. Nevertheless, a somewhat larger volume of business has been done in some directions, particularly with rolling mills, which have found

it desirable to cover the sales of Bars recently made, and have been buying more freely than for some time such stock as Cast Scrap, Borings, Turnings, Wrought Pipe and No. 1 Railroad Wrought. The demand for Heavy Melting Steel Scrap is quieter than it has been for the past three or four weeks. Car Wheels are being purchased in good quantities by dealers, who consider them good property at current quotations, although consumers are still manifesting no interest in them. Quotations are about as follows, per gross ton, New York City:

Old Girder and T Rails for melting	\$11.00 to \$11.50
Heavy Melting Steel Scrap	11.00 to 11.50
Old Steel Rails, rerolling lengths	11.50 to 12.00
Relaying Rails	20.50 to 21.50
Old Iron Rails	14.50 to 15.00
Standard Hammered Iron Car Axles	16.00 to 16.50
Old Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	12.00 to 12.50
Iron Track Scrap	10.00 to 10.50
No. 1 Yard Wrought, long	11.00 to 11.50
No. 1 Yard Wrought, short	10.00 to 10.50
Light Iron	5.50 to 6.00
Cast Borings	5.00 to 5.50
Wrought Turnings	6.50 to 7.00
Wrought Pipe	9.50 to 10.00
Old Car Wheels	12.00 to 13.00
No. 1 Heavy Cast, broken up	13.00 to 14.00
Stove Plate	9.50 to 10.50
Locomotive Grate Bars	10.50 to 11.00
Malleable Cast	11.50 to 12.50

Rogers, Brown & Co., 30 Church street, New York, have been appointed selling agents for the Western Foundry & Supply Company, producer of ground and lump ferromanganese, ferrosilicon, ferro chrome, manganese, copper and other alloys. The Western Foundry & Supply Company has plants at East St. Louis, Ill., and Elizabethport, N. J.

## Metal Market.

NEW YORK, June 10, 1908.

**Pig Tin.**—Dullness continues. Since June 1 less Tin has been sold than in any like time this year. The total sales this week will probably not exceed 150 tons. The holidays in London had no effect on prices because there was no business. Price changes during the week, although small, have been toward lower levels, as follows:

	Cents.
June 3	28.70 to 28.85
June 4	28.55
June 5	28.15
June 8	28.20
June 9	28.25
June 10	28.25 to 28.37½

Deliveries this month will be light, as, in addition to the 1275 tons arrived, only about 1000 tons more will make this month's delivery. The price of Future Tin in London is now above Spot—an unusual condition. It is explained that this is not a premium but is more of a carrying charge, and it is possible that it may increase. The London market closes firm, at £128 17s. 6d. for Spot, and £129 5s. for futures, a decline, since last week, of £2 for Spot, and £1 for futures.

**Copper.**—The market is a shade firmer, with Electrolytic obtainable at 12.75c., and Lake at 13c. The price of Electrolytic might be shaded for export. Some better inquiry is noted, especially from the larger trade. Much of this, however, has been stimulated by the rumors that railroad companies would again enter the general market after July 1. The largest consumers of Ingot Copper—the wire drawers—have very little business. Those manufacturing lighter forms, however, report some increase. One factor, which seems to impart confidence, is the refusal of the selling companies to sell other than to actual consumers. In other words, they want no Copper but their own to come on the market when prices advance. No buying of consequence from Europe has been noted this week, but this absence is clearly traceable to the holidays in London. The market there is firmer, closing to-day at £58, 10s. for spot, and £58, 18s., 9d. for futures. The exports for the first 12 days of this month were 8700 tons. L. Vogelstein & Co., agents for Aron Hirsch & Sohn, Halberstadt, Germany, figure the deliveries of foreign Copper into Germany for the first four months of 1908 as 53,810 tons, compared with 36,225 tons during the same period in 1907.

**Pig Lead.**—The unexpected announcement of a 5c. advance in Lead June 3 was followed by a still greater surprise June 5, when a further advance of 10c. was made. The price of 4.50c., New York, is now quoted alike by the leading interests and independent sellers. No cutting of prices is made by merchants, some of whom must have considerable Lead which now shows a handsome profit. The St. Louis price has been advanced to 4.35c. In London, Soft Spanish Lead has again declined, being now quoted at £12 10s., or about 2.75c. per lb.

**Spelter.**—Business is dull, and the efforts to stimulate activity have so far been without avail. Prices are slightly



higher, at 4.42½c. to 4.45c., St. Louis, and 4.57½c. to 4.60c., New York.

**Nickel.**—Prices are without change, at 45c., for ton lots, and 55c. to 60c., for smaller quantities.

**Antimony.**—Business is dull, and prices are without change. Cookson's is held at 8.50c., Hallett's at 8.50c., and outside brands at 8.25c.

**Tin Plates.**—The heavy buying for the season is about over, but the mills are actively engaged in turning out orders. The old quotation of \$3.70, Pittsburgh, and \$3.89, New York, for 100-lb. IC Coke Plates, continues. In Swansea, Welsh Plates are 1½d. easier, at 12s. 1½d.

**Old Metals.**—Domestic consumers are buying more freely, but in small lots. The tonnage disposed of is therefore small. The export trade continues good. Dealers' selling prices are about as follows:

	Cents.
Copper, Heavy and Crucible.....	12.00 to 12.25
Copper, Heavy and Wire.....	11.75 to 12.00
Copper, Light and Bottoms.....	10.75 to 11.00
Brass, Heavy.....	8.75 to 9.00
Brass, Light.....	7.00 to 7.25
Heavy Machine Composition.....	11.50 to 11.75
Clean Brass Turnings.....	7.75 to 8.25
Composition Turnings.....	9.50 to 10.00
Lead, Heavy.....	4.20
Lead, Tea.....	3.85
Zinc.....	3.50

### Iron and Industrial Stocks.

NEW YORK, June 10, 1908.

Stock values are maintaining themselves quite well under what might be considered adverse conditions. Possibly the very encouraging outlook for this year's crops is having much to do with the stability of stock prices. The fluctuations have recently not been wide, but at the same time it must be said that transactions have not been large. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week has been as follows: United States Steel common 36¾ to 38½, preferred 101½ to 102¼; Car & Foundry common 33¾ to 34¾, preferred 98; Locomotive common 48¾ to 50½, preferred 102½ to 102¾; Steel Foundries common 6, preferred 33½ to 34; Cambria Steel 30¾ to 31; Colorado Fuel 26¾ to 28; Crucible Steel common 5¾ to 5½, preferred 42½ to 43; Pressed Steel common 27 to 28½, preferred 82 to 83; Railway Spring common 37½; Republic common 17½ to 18½, preferred 66¾ to 70; Sloss-Sheffield common 49¾ to 51; Cast Iron Pipe common 27 to 27½, preferred 74¾; Can common 5, preferred 55 to 55½. Allis-Chalmers stocks have had quite a movement, the common closing at 10, and the preferred at 29¼ on Tuesday. Last transactions up to 1.30 p.m. to-day are reported as follows: United States Steel common 37½, ex-div., preferred 101½, bonds 96¾; Car & Foundry common 34½, preferred 98; Locomotive common 49½, preferred 102½; Colorado Fuel 27¼; Pressed Steel common 28½, preferred 83; Railway Spring common 37½; Republic common 17½, preferred 67; Sloss-Sheffield common 51½; Cast Iron Pipe common 27½, preferred 74¾; Can common 5, preferred 56.

The directors of the Pressed Steel Car Company have decided to anticipate the redemption of \$500,000 bonds due February 1 next by paying off the amount of the securities in interest on or before August 1. The bonds are part of an issue of \$5,000,000 put out in 1901, of which \$500,000 have been redeemed annually. The anticipated redemption of \$500,000 at this time will reduce the amount outstanding to \$1,000,000.

The profits of the Barney & Smith Car Company for the fiscal year ended March 31, are reported at \$508,639. The balance transferred to the undivided profit account, after charging bond interest and dividends, brought that item to \$474,163. No reduction was made for depreciation, as repairs and betterments were charged against earnings.

**Dividends.**—The American Smelting & Refining Company has declared the regular quarterly dividend of 1 per cent. on the common stock, and 1¾ per cent. on the preferred stock, payable June 26 and July 1, respectively.

The Ingersoll-Rand Company has declared a semiannual dividend of 3 per cent. on the preferred stock, payable July 1.

The Canadian Westinghouse Company, Ltd., has declared a quarterly dividend of 1½ per cent., payable July 10.

The International Silver Company has declared a quarterly dividend of 1 per cent. on the preferred stock, payable July 1.

The Otis Elevator Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable July 15.

The Empire Steel & Iron Company has declared a semiannual dividend of 3 per cent. on the preferred stock, payable July 1.

The Hydro-Electric Power Commission of Ontario will receive up to June 15, inst., at its office in Toronto, ten-

ders for the construction of steel transmission towers, transmission line cable and the erection of a complete transmission system, first between Niagara Falls and Toronto, and, second, between Niagara Falls and St. Thomas.

### Steel Prices Reduced.

An important meeting of the steel trade was held in New York on Tuesday. There were present about 50 representative steel men, who included the heads of the leading independent companies, as well as the presidents of a number of the United States Steel Corporation's subsidiaries. The proceedings were summarized by Judge Gary in the following official statement:

"The representatives of the leading steel manufacturing companies have been in session during the day. It is understood the price of iron ore has been, or will be soon, reduced 50 cents per ton, base.

"Each one of the steel manufacturers expressed the opinion that there should be a readjustment in the prices of their respective commodities as follows: Billets from \$28 per ton to \$25, Pittsburgh; sheet bars from \$29 per ton to \$27 per ton, Pittsburgh; plates from \$1.70 per 100 lb. to \$1.60 per 100 lb., Pittsburgh; structural iron from \$1.70 per 100 lb. to \$1.60 per 100 lb., Pittsburgh; merchant pipe a reduction of two points, or \$4 per ton, Pittsburgh; wire nails from \$2.05 per 100 lb. to \$1.95 per 100 lb.

"Sheet and tin plates were reduced early in the year, therefore no changes were considered in the prices of these products.

"It is hoped these changes will not necessitate a general or radical readjustment of wages, which it is desirous to avoid."

The Association of Iron & Steel Electrical Engineers will hold its first annual meeting in Philadelphia June 24 and 25. The committees that have been appointed are as follows: Finance, E. W. Yearsly, G. H. Winslow, James Farrington; Papers, E. W. Yearsly, P. D. Brown, G. W. Richardson, G. M. Sturgess; Library, G. H. Winslow, L. R. Palmer; Board of Examination, B. R. Shover, J. C. Reed, L. R. Palmer; Editing, L. R. Palmer, G. H. Winslow; Standardization, F. P. Townsend, G. W. Richardson, G. M. Sturgess. G. H. Winslow is secretary and treasurer, 559 Frick Annex, Pittsburgh, Pa.

The decision of independent vessel owners to hold shipping in ports until about July 1 emphasizes the dullness of the ore trade. Dividends to stockholders in lake craft can only be paid this year out of surplus, if any such exists, and the lake shipbuilding industry has received a setback from which it will take some years for recovery. So many ships have been financed from high dividends in past years, for which there was no real need, that the lakes are overbuilt. Capacity for more than 50,000,000 tons annually now exists, in big, modern ships.

The graduates from the Winona Technical Institute, Indianapolis, Ind., this year number 202, against 108 last year. The commencement exercises took place May 28. Graduates from the foundry school came from four States. The other graduates were from the schools of metallurgy, electricity, pharmacy, printing, lithography, carpentry, tile and mantel setting, painting and decorating, press work, typography and linotype and library.

The promoters of the National Rolling Mills Company, whose works are to be established at Sydney, Nova Scotia, speak hopefully of the progress of their financial arrangements. The plant they have in contemplation is to be a large one.

At Morrisburg, Ont., the mills of the Canada Tin Plate & Sheet Steel Company have resumed operations. The company, which has had its works closed down since the fire of last January, is said to have enough business booked to keep it going up to the end of the year.

## South African Trade Conditions.

DOUGLAS, CAPE COLONY, May 2, 1908.—A description of the state of trade at present prevailing in South Africa would be incomplete without a reference to the progress of the country in the recent past. It is well, perhaps, to mention that the state of the market as affecting the commercial world has been grossly exaggerated in some of the leading English and American trade journals; and although a long list of comparative figures would be somewhat wearisome to American readers it is necessary to indicate that some progress on the previous year's trade, especially with reference to hardware and machinery, has been a feature of the past 12 months.

The importation of American goods has declined considerably, now amounting to practically nil. This fact is doubtless due to the keen competition by Canada for the foremost place in the agricultural implement and machinery market, and also to the preferential customs tariff in favor of British-made goods.

### An Effect of the Depression in America.

The depression, although affecting the country throughout, is undoubtedly at its worst in Kimberley. The chief cause attributable to the gloominess witnessed in this hitherto exceedingly prosperous center, is consequent upon the financial crisis in America. In spite of the attempts made to avert disaster to the city, the De Beers Company has been compelled to cease operations at two of its leading mines. Business everywhere in Kimberley is at an inconceivably low ebb. Probably no other center of importance in the world is so dependent upon one industry as Kimberley is. Ever since the opening of the diamond fields a little over 30 years ago, no attempt has been made to introduce a fresh source of business in case of the proverbial "rainy day" putting in an appearance.

Railroad development, excepting a few small lines already begun, has not been a feature of the year's progress. There are several reasons accountable for stagnation in this direction. First, there is the ever-present friction prevailing between the various administrations with regard to tariffs. Second, the wave of excitement witnessed in the move now being made toward unification or federation has caused the several governments to postpone all measures for increasing their railroad systems. Last, there is the general depression. In the Cape Colony, however, sufficient optimism prevails with regard to the future; for, although financial experts decry the movement, the Cape Parliament has agreed to commence several branch lines of railroads at an early date. Indeed, the laxity of the government in two instances, resulting undoubtedly through lack of funds, has caused two companies to petition Parliament for the right to construct two branch lines by private enterprise.

South African farming methods are not, generally speaking, commendable to older countries; nevertheless, signs are not wanting to show that there is an improvement upon the traditional system fast approaching. Everywhere farmers are boring for water, constructing dams, introducing up to date appliances in their dairies, adopting modern methods for sheep shearing, erecting windmills, &c. They are generally awakening from that lethargic state which has been characteristic of South African farming since the days of early settlement. All this goes to prove that the demand for implements, machinery and other farming requisites is encouraging to manufacturers. So much for farming.

### Mining Interests.

Dealing next with mining (though strictly speaking this branch of industrial development should be accorded the first place in spite of all that has been said of late rating it as of second import), very satisfactory data can be given, excepting for the time being the diamond industry. On the Rand (Johannesburg) considerable progress has been made. New propositions have been opened up and the deeper levels are fast becoming prominent as contributors to the gold output. In addition to the ordinary facilities for working the reef, the latest improvements in methods and machinery employed all along

the Rand warrant more than a mere passing reference. These mines are equipped as probably no other mines in the world are equipped, especially as regards electrical appliances, and recently electrical furnaces for sharpening drills have further augmented the already replete list.

In Rhodesia—although an insignificant contributor of the yellow metal—much progress has been made in small mining properties. Small stamp batteries have been in great demand; so also have the lesser items of hardware—picks, shovels, &c.—connected with mining equipment. The tobacco industry has also provided several opportunities for machinery firms. Farming implements, however, have not been in demand owing to the unsatisfactory conditions of settlement proffered by the Chartered Company to intending settlers.

Natal, as a whole, has not done so badly. The leading colliery companies have had a satisfactory increase over the previous year, and indeed bid fair to have a better show of trade than ever. Machinery has been acquired for the purpose of washing the small coal, and the results from this source alone have been highly gratifying; so much so, in fact, that all companies now intend adopting the system. The demand for coal occasioned by the steamship companies has compelled the Natal Government to construct an additional line along the sea front to the collieries, and also place orders for heavier rolling stock in order to meet the coal companies' demands. Several factories have been completed and others are now being erected in various places near the coast for the manufacture of dynamite, candles, soap, matches, &c.

The advocates of American farming methods received a considerable setback during the last session of the Natal Legislature, when it was proved that the steam plow as a feature of South African farm life was doomed to extinction. It appears that several months back some £7000 were expended on steam plows, with a view to providing farmers with increased facilities for cultivating their lands, but in every instance, owing to the terrible nature of the ground under treatment and the smallness of the farms concerned, these plows were a complete failure. In the Transvaal also the same discouraging results have been witnessed.

### Supporting Home Industry.

The great cry, "support colonial industry," is everywhere bearing fruit, and in this direction the prominence now being given to metal manufactures is worthy of attention. Several firms have established themselves in the more important centers, and the products from their workshops are equal in every way to the imported article. There are besides ordinary sheet metal goods, castings from recently built foundries and lead work of an almost endless variety in evidence. In nearly every case the metal used has been brought from mines in the country. It may here be stated that much assistance has been accorded the metal makers by the general legislation of the various governments in the direction of opening up and facilitating development in every way of the base metal properties observed on every hand. One satisfactory feature of the latter is the fact that quite recently over 60 tons of pure tin (alluvial) has actually been exported from the Transvaal. Thus it will readily be seen that South Africa is destined to become a manufacturing country of no mean import at some future date.

A discovery which promises to revolutionize boiler covering processes has recently been announced from the Transvaal. The substance, which is a natural earth, is known as "Kieselguhr," and exists in unlimited quantities in several places in the colony named. At first no attention was paid to the discovery, but the investigations of a scientist have resulted in practical tests being made by several large firms in the direction above named. It appears that by mixing Kieselguhr with a small quantity of asbestos, a substance is formed which is far superior as a covering for boilers and the like to any material at present known. Leading politicians aver that from this source alone the Transvaal can build up a large trade.

It is pleasing to note the dawn of an electrical age. Throughout the country, town councils are vying with one another in installing electrical plants. Some hun-



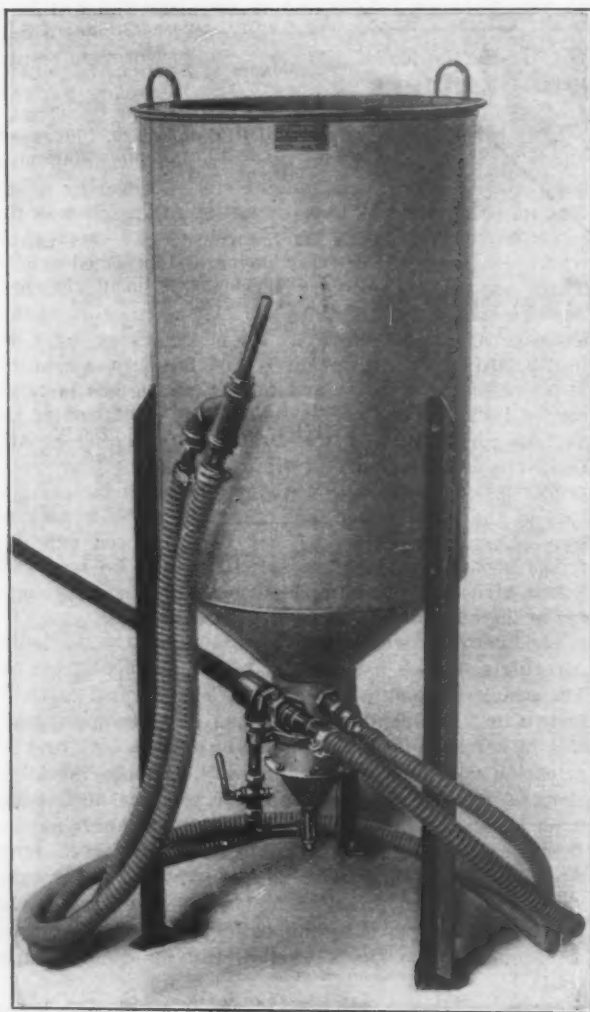
dreds of thousands of pounds sterling have recently been expended in this direction—a feature which certainly does not signify depression, surely! At East London £35,000 has been voted for an extension of plant and buildings, while at Johannesburg £27,000 is being utilized for a similar purpose. In addition to the latter scheme the Victoria Falls Power Company is erecting a gigantic power station, with which to supply the Rand mines with electrical energy. The schemes just mentioned are but a few of the most important; many others of lesser import are being carried into effect at various places.

The Slope drill contest has excited the interest of drill manufacturers the world over; and although the competition will not take place until January next (1909), many of the world's leading drill manufacturers are now seeking information on the subject. It may therefore save considerable time, and thereby enable American firms intending to compete, to state that all types of rock drills will be eligible. Drills using compressed air will be supplied with a pressure varying from 60 to 75 lb. per square inch at the surface. The mining regulations require the provision of dust allaying appliances. Competitors must make arrangements accordingly. There will be two prizes, one of £3000 and one of £1000.

#### The Leiman Sand Blast Apparatus.

Most foundries have use for a sand blast, either to clean sand from castings or patterns or to produce some style of finished surface on metals. A moderate priced, compact apparatus for all classes of light or heavy work is illustrated herewith as made by Leiman Brothers, Brill street and Bonykamper avenue, Newark, N. J., and 139 Center street, New York City.

The nozzle of this new machine is a long, straight piece of ordinary iron pipe and does not have the tapered



A Sand Blast Equipment for Foundries Made by Leiman Brothers, Newark, N. J.

hole used on other sand blast nozzles and therefore is less subject to wear. The air goes directly from the compressor to the mixing chamber at the base of the nozzle, the vacuum there created drawing the sand through the sand feed pipe from the body of the machine. As the sand reaches the mixing chamber it receives the full pressure of the air to drive it through the nozzle so that there is not the necessity of making the nozzle tapered to increase the velocity. In this way not only can a larger nozzle be used, thereby covering a much larger surface with a given pressure of air, but it may be longer (even to the extent of several feet), enabling the operator to stand at a distance from his work with just as satisfactory results.

Since the air does not go through the body of the machine, the latter does not need to be of steel, and heavy galvanized iron answers the purpose. The sand is dried by heating and is then simply thrown into a depressed sieve at the top of the machine being then sifted automatically. The machine holds enough sand for 3 or 4 hr. continuous operating and the 10-ft. double length of wire-covered rubber hose with which the machine is equipped makes it possible to operate the nozzle in any direction.

Leiman's rotary high pressure blowers or any air compressor may be used with this machine. The sand blast machine when mounted on a movable platform with a blower may be moved out of the way when not in use and the sand blasting room used for other purposes.

**The Monitor Stove & Range Company.**—Injustice was unintentionally done to this company in a paragraph regarding the new E. H. Bardes Range & Foundry Company, published in *The Iron Age* of May 28. The Monitor Stove & Range Company, organized in the early part of last year, is the direct successor to the old and very widely known William Resor Company and is operating the plant in Cincinnati, Ohio, which was run for so many years by that company, having in addition taken over all the patterns and acquired everything else pertaining to its business. The Monitor Company is therefore the exclusive manufacturer of the Resor lines of stoves. The plant remodeled for the Bardes Company was formerly occupied by John A. Schulte & Co., and not by the William Resor Company.

At Pittsburgh last week an answer was filed in court by 23 creditors of the Shenango Iron & Steel Company against which bankruptcy proceedings were recently commenced. They deny the allegations of the complainants that the Shenango Iron & Steel Company transferred a portion of its property to Bole, Ross & Co., while insolvent, or that it is a bankrupt corporation. It is also alleged that the petitioners became creditors of the Shenango Iron & Steel Company after a mortgage, under which that alleged preference was made, had been recorded. The Shenango Iron & Steel Company is now in the hands of a receiver, appointed in the bankruptcy proceedings.

The Riter-Conley Mfg. Company, Pittsburgh, is finishing a job under a contract involving in the neighborhood of \$1,000,000 for the Rio de Janeiro Tramway, Light & Power Company in Brazil. This has included the construction of power houses, transmission towers and the laying of three miles of 8-ft. steel riveted pipe in connection with a hydro-electric system having as its power source a reservoir in one of the mountains at a point about 56 miles from Rio. The water thus piped under a tremendous head will furnish the power for generating electricity, which will be carried to the city.

The Atikokan Iron Company's furnace at Port Arthur, Ont., has not yet been relighted. It is stated that present prices are below the cost of production at that plant.

Canadian manufacturers of motor cars are increasing their sales in Australia since the amended duties came into operation there.

## The Machinery Trade.

NEW YORK, June 10, 1908.

Reports in the machinery trade are encouraging and well informed houses are expecting an increased demand from the more important interests, particularly the railroads during the summer, but thus far none has actually come into the market for extensive equipment. As a result of the adherence to the policy of retrenchment the demand the past week was almost wholly from the smaller manufacturing enterprises, and, though better with many houses, the business placed was not large enough to distribute more than a fair amount to the greater number of dealers and manufacturers. Inquiries with some houses were not so numerous as they were the last week of May. Manufacturers of power plant equipment have been aided by the large number of municipal plants being established throughout the country, but machine tool houses have been less favored, new projects and substantial additions to works being few and slow in consummation.

Supplementing our recent statement that many railroads are preparing to make machinery purchases to put their shops in shape to repair the rolling stock standing in the yards of most of the important roads, comes the information that in the South and New England especially master mechanics and other shop officials are making up lists of needed machinery equipment. A number of machinery men on receipt of the information mentioned in these columns last week, to the effect that some of the roads would commence buying on July 1, made hasty trips to the more important railroad shop centers and several of them came back this week with cheerful information. It has been known, of course, in machinery circles for some time that many railroads were badly in need of repair equipment, as during the prosperous times they were running their car service to full capacity and when the slump came it was found that a great deal of the rolling stock was in urgent need of repairs. With the lessening of the demand for freight service many of these cars were sent to the yards because most of the roads were curtailing expenses and laying off hands. Many needed repairs were not attended to as there was no urgent need of cars. With the demand for added freight service from manufacturers many railroads would be unable to cope with the future and, realizing this, efforts are being made to put shops in shape to handle the repair work. One house reported a number of sales to Southern roads, and on investigating conditions at the shops the machines were ordered sent to it was found that they would not be put in operation at once, but were to be held ready for a resumption of heavy freight traffic when shop officials would be justified in adding more mechanics to their repair force.

Considerable buying was done the past week by the Japanese Government through the export houses in this city, the more prominent of which are Mitsui & Co. and Takata & Co. It is learned from a reliable source that the Japanese Government will buy large quantities of material for Manchuria, which it is opening up, and from the orders already placed it is evident that the purchases yet to be made will include a great deal of mechanical equipment. At various times within the past few months considerable buying has been done by the Japanese houses, but it is expected that the material to be bought will greatly exceed in volume any buying that the Government has done lately.

Manufacturers of steel castings are encouraged as to the outlook for future business, because of the fact that many machinery manufacturers now show a disposition to make long time contracts for castings. As has been stated here before, machinery manufacturers in general have been loth of late to bind themselves to any agreement covering the purchasing of castings in set quantities, preferring to buy them in small quantities as they needed them. Some of them are now making inquiries, however, with a view to ascertaining terms for extending their contracts over a period of six months or more, and this is taken as an indication that they see sufficient business ahead to warrant their placing orders for a quantity of material to be delivered at regular periods.

Some of the automobile manufacturers are overhauling their equipment and sending out inquiries for the new machinery they will require for bringing out their 1909 model. Among those is the Maxwell-Briscoe Company, Tarrytown, N. Y., which has inquiries out for a few machines.

### Machinery Requirements for Cement Plant.

Within the next few weeks contracts will be closed for a large amount of equipment for the plant in course of construction at Wampum, Pa., for the Crescent Portland Cement Company. The Curtin-Ruggles Engineering Company, 39 Cortlandt street, New York, is superintending the construction of the plant and acting as consulting engineer, but the machinery equipment, it is understood, will be purchased by R. H. Hughes, who represents the cement com-

pany and is making his headquarters at Wampum. The trade is now bidding on engines and boilers to furnish about 3600 hp., and it is understood that a Corliss engine will be favored in the selection. The dryers will be furnished by the Curtin-Ruggles Engineering Company, but the other cement making equipment and conveying machinery will be purchased in the market. The buildings are to be of steel and concrete construction, and the plant will be capable of turning out about 3000 bbl. of cement a day. The structures to be erected include a kiln building, 120 x 200 ft.; raw grinding building, 100 x 280 ft.; dry grinding building, 60 x 240 ft.; coal pulverizing building, 70 x 100 ft.; storehouse, 70 x 500 ft., and a machine shop and office building. In addition to the cement making equipment a small machine shop outfit will be purchased, to include probably one or two planers, one or more lathes, drills and some blacksmithing appliances. The contract for the power will be let, it is understood, within the next two weeks, and machine shop equipment and conveying machinery will be gone into next. Work of constructing the plant is already under way. The Portland cement company has a plant in operation at Wampum at present, and although the buildings now being erected may be looked upon as an addition, they will constitute a complete cement making plant. The company owns several acres of land which is underlaid with veins of coal, shale, cement rock and cement stone.

Reference was recently made in these columns to the new plant to be erected near Fort Trumbull, Conn., by the W. D. Forbes Company, Hoboken, N. J. Contract has been awarded for the erection of a plant to consist of a main building, 50 x 200 ft.; power house, 30 x 40 ft., and an office building, 35 x 65 ft., all two stories high. The company has not yet decided upon the additional machinery it will purchase for completely equipping the new buildings.

The National Conduit & Cable Company, Hastings-on-Hudson, N. Y., is preparing to make some extensive additions to its plant. It is understood that inquiries will shortly be sent to the trade for power equipment of from 8000 to 9000 hp. The improvements will include, it is understood, an extensive addition to the company's rod mill and a good sized sheet mill. It is not thought that any of the buying has been done as yet, but it is said that the power inquiries will be before the trade before the month is out.

The Bethlehem Steel Company, South Bethlehem, Pa., is receiving bids on power equipment to furnish about 1000 kw. for an addition to the plant. It is said in the trade that this will be used to furnish power for the section of the plant devoted to the construction of gas engines, and it is probable that the company will require some additional machinery for that department.

The Board of Water Commissioners of Atlanta, Ga., will receive bids until July 8 for three 300-hp. horizontal water tube boilers, to have a working pressure of 200 lb. The boilers are to be erected and bricked in complete on foundations furnished by the city at Hemphill pumping station No. 2, on the Southern Belt Railroad, and are to be ready for steam connections by October 1.

The Board of Contract & Supply of Schenectady, N. Y., will receive bids until June 24 for machinery and other equipment for the Ferry street pumping station, consisting of one low duty and two high duty pumps, with all piping and valves, and four return tubular boilers.

The tabulation of the bids opened June 3 for the construction of the Rondout siphon of the Catskill Aqueduct shows that the lowest bid was submitted by the T. A. Gillespie Company, New York, and that it was considerably in excess of the estimated cost of the work. The bids received were as follows: T. A. Gillespie Company, \$6,290,803; Bradely Construction Company, \$6,414,335; McArthur Brothers Company, \$6,419,173; Degnon Contracting Company, \$6,579,410; S. Pearson & Son, \$6,787,111.

## Philadelphia Machinery Market.

PHILADELPHIA, PA., June 9, 1908.

Buying has been of a desultory character. Inquiries in some cases are reported to have been somewhat more numerous, but are largely of the class which do not result in immediate business. The trade is following up all available prospects closely, but finds it difficult to get buyers to place orders except for tools urgently needed for work of some special character, under which circumstances single tools are usually purchased. The larger industrial concerns are practically out of the market, inasmuch as they themselves have a considerable amount of tools and machinery idle, and until they obtain sufficient business to keep the present equipment engaged there is little chance of their making any heavy purchases of new tools. A number of concerns needing equipment have practically decided on their purchases, but withhold actual orders until such time as they see some substantial improvement in general business.

The railroads make no move to enter the market. One small road has bought a few tools, but the purchase was not



such as to have any effect on the trade or warrant the belief that the railroads, generally speaking, were about to begin to purchase.

Dealers report sales as very much scattered. One concern, which received a number of good orders week before last, reports almost an entire absence of business last week. Another reports several single sales of shapers and lathes, while others have sold radial drills and a general line of small tools. New propositions are scarce, most of those which have developed recently having been small, although one pretty fair one embracing the purchasing of some \$10,000 or \$12,000 is before the trade and expected to develop the current month.

No particular improvement is to be noted in the export demand. Some little business of a special character has developed, and is being figured on, but actual orders are not plentiful. In the usual line of standard machine tools, practically nothing has come out in this territory. Manufacturers who have an established trade abroad report business slow except in the power transmission line, which is holding up pretty satisfactorily.

The demand for second-hand tools and machinery holds up particularly well. Some dealers report aggregate sales as quite large, and as covering a wide range. The greater part of the business is confined to tools of the smaller and medium sizes, although an occasional sale of a tool of the larger size is reported. Second-hand boilers and engines are not in as good demand as second-hand machine tools, and sales do not aggregate a large total. There is a better demand for new power equipment, particularly in the way of boilers, and some fair sales of the medium and the larger sizes are reported.

Business in the gray iron foundry trade does not improve rapidly. Jobbing foundries report the demand light and irregular. Some steel casting plants have picked up a little business, but no particular gain in production is to be noted. Until machine tool builders, the railroads and other large users of castings come into the market, no marked improvement in the foundry trade is anticipated.

Bids were opened last week by the Department of Public Works, city of Philadelphia, for the construction of five bridges, mention of which has already been made. For the bridge over the Philadelphia & Frankford Railroad at Large street, 10 bids were presented, the proposals varying from \$36,810 to \$24,300. Eight bids were received for the bridge over the boulevard in the Thirty-fifth Ward, ranging from \$41,612 to \$25,325. Another boulevard bridge also had eight bidders, the proposals ranging from \$46,312 to \$32,340. Bidders for the Forty-second street bridge over the Pennsylvania Railroad numbered nine, the bids varying from \$116,000 to \$76,950; while for another bridge over the Baltimore & Philadelphia Railroad there were 14 bidders, the cost of the work ranging from \$44,100 to \$27,800. The time in which the various bidders agreed to complete the work also varied greatly. The bids were ordered scheduled and will be awarded at a later date.

Felin & Co., packers, have taken out city permits for an additional abattoir at their plant, 4144 to 4152 Germantown avenue. The plans provide for a three and two story addition of steel and concrete, 89 x 234 ft. Plans are also being made for further additions to the plant. It is understood that considerable equipment incident to the packing business is to be installed.

The Pennsylvania Railroad Company awarded contracts last week for building new passenger stations at Broadway, Camden, N. J., and Swissvale, Pa. The former involves an expenditure of \$25,000, and was awarded to James McGroth Company, of this city, the structural steel and covered platforms being furnished by the Wayne Iron Company, Wayne, Pa. The contract for the Swissvale station was awarded to the Pittsburgh Construction Company.

The Philadelphia Roll & Machine Company notes an increase in orders for both sand cast and chilled charcoal iron rolls, special rolling mill machinery, mill machinery parts and special air furnace charcoal iron castings. The plant is now being operated four and five days a week alternately. Orders are coming in from a widely scattered territory, and the outlook is considered favorable. Shipments of rolling mill machinery have been numerous to both nearby mills and concerns in the Middle West. Several heavy retorts, weighing upward of 12,000 lb. each, are also about ready for delivery.

The Tropenas Steel Company, New Castle, Del., now has its new foundry building under roof, and the general construction work about the plant is said to be coming on satisfactorily. The company will purchase two 150-hp. return tubular boilers in the next few days. Practically all the general equipment, except machine tools, has been purchased, and these, which will include a complete machine and pattern shop equipment, estimated to cost between \$10,000 and \$12,000, will be purchased early in August.

The Schutte & Koerting Company, Philadelphia, Pa., manufacturer of steam and engineering specialties for power plants, chemical and other industries, has opened a branch sales office in the Keenan Building, Pittsburgh, Pa., where

it is represented by E. A. Knowlton. The company's new catalogues, which are being distributed in three sections, one section pertaining to apparatus for the chemical industry, one to apparatus for use in power plants, &c., and a general catalogue illustrative and descriptive of its entire line, is probably one of the most up to date and complete catalogues published by any engineering firm. These will be sent on request to those interested.

## Chicago Machinery Market.

CHICAGO, ILL., June 9, 1908.

There is nothing in the volume or character of transactions for the opening week of June indicative of progressive improvement in the demand for machinery; this result, however, is not fraught with disappointment, since it has not been generally expected that a strong revival of business would be realized at this time. While the demand is far from satisfactory in all lines Western dealers and manufacturers find a source of congratulation in the fact that, considering the severity of depression, it has receded no farther than it has. Although comparative figures contrasting the present volume of business in the various machinery lines with those of last year, or even with normal average, are not obtainable, individual experiences serve to give some idea of the situation. One prominent machine tool house states that at no time during this year has its sales fallen below 33 per cent. of those in corresponding periods of last year, and last month its aggregate sales were two-thirds as large as those for May, 1907. While in the latter respect the results are doubtless exceptional, reports from other sources would indicate that in the average the general experience has been as good or better than that of the house in question. When it is considered that there has been a practical cessation of buying by the large interests, including the railroads, and that the principal part of the entire volume is comprised of incidental requirements of the less important manufacturing industries, it will be realized that, in spite of adverse conditions, the country's activities and the tide of prosperity have not ebbed as far as is sometimes assumed. There is on every hand a growing conviction that the month of July will mark the beginning of more liberal purchases by the railroads, and it is thought that among requisitions held up for some time there are not a few for tools and other machinery equipment that will begin to come out after the close of the fiscal year, June 30. It is not assumed, however, that the expected freer purchasing by the railroads will assume extraordinary proportions, but it is reasoned that there is a good deal of machinery and material they will be compelled to buy, the expenditures for which they wish to carry over into next year's budget.

Two new shop equipments are included in recent sales of boiler shop and fabricating machinery, to which were added a fair number of sales of individual tools. The boiler shops are admittedly running very slack, but even in the absence of present activity manufacturers are not wholly unmindful of the requirements of the future and of the need of preparing to meet them. It is understood that the machine tools required for the equipment of the machine shop at the Corn Products Company's new plant have been purchased, the orders being concentrated in the hands of a few dealers.

Among the orders for machinery recently taken by Joseph T. Ryerson & Son, Chicago, were tools for the equipment of the Mesaba Boiler & Mfg. Company, Duluth, Minn., comprising an air compressor; boiler punches, including one 36-in. throat, with capacity of punching 1½-in. hole through 1 in.; a set of 10 ft. 2 in. bending rolls; an 8-ft. radial drill, and a complete equipment of air tools and hoists; also to the C. H. Sharp Contracting Company, Kansas City, Mo., for installation in its shops at Sheffield, Mo., one 10-ft. flange clamp, one air compressor, two plate punches, and one flue welding machine.

The Hildreth Mfg. Company, Lansing, Mich., maker of high grade marine engines and gray iron castings, has recently added a new core oven and core room to its plant, and states that it is running full time on gas engines and general jobbing work, its output at the present time being 25 per cent. greater than at any time in its history.

The Colorado Springs Electric Company, Colorado Springs, Colo., has decided to make extensive improvements to its power station on West Cucharas street, which will include the construction of a generating station to take the place of a sub-station now located at that point. Plans for this work have been completed, and it is stated that work will begin at once with a view to having the plant ready for operation in the early fall. The brick portion of the present plant will be used as a storeroom and the frame buildings

will be torn down and replaced by a new structure to house the new equipment. The generative capacity of the new installation will be about 1500 kw., and the outlay required for the estimated improvements will be in the neighborhood of \$100,000. Geo. Bullock of New York is president of the company.

The United States Reclamation Service, 777 Federal Building, Chicago, will take bids until June 24 for furnishing machinery equipment required for the installation of a large hydro electric plant at the Minidoka Project, Idaho. Included in the requirements for this work are four 1200 kw. 2300 volt alternating current generators of the vertical turbine type with a revolving field and stationary armature; eight 600 hp. synchronous vertical motors for direct connection to pumping units; one 360 hp. synchronous motor, vertical type; four belt driven air compressors to deliver 20 cu. ft. of free air per minute against 80 lb. pressure; four vertical turbines equipped with penstock and draft tube, each of capacity to drive a 1200 kw. alternator; two vertical turbines of 120 kw. capacity; three centrifugal pumps, capacity 125 second-ft.; one centrifugal pump, capacity 75 second-ft.; three 6-in. top suction standard vertical centrifugal pumps. In connection with this machinery there will be required all electrical accessories and auxiliary hydraulic equipment required to complete the installation.

### Cleveland Machinery Market.

CLEVELAND, OHIO, June 9, 1908.

Some improvement is noted in the demand for many lines of special machinery, but in the machine tool market conditions remain about stationary, although a few dealers notice a slight improvement in orders. As few manufacturing plants are running at their normal capacity and the majority have tools that are still idle, there is practically no demand from this class of the trade and sales are limited to an occasional single tool. Inquiries are light in volume and are limited to single tools, or two or three at the most. While tool dealers are doubtful if the cut in the price of iron and steel bars will have any tendency to improve their business, they believe that if the price reduction should be extended to structural material it would indirectly have some beneficial effect. In view of the existing conditions, however, dealers do not look for much change in the machine tool market before the end of the summer.

With the exception of a few sales of small lots of machine tools to automobile plants, the demand at present comes almost entirely from small new concerns that are buying a few light tools. A large share of this trade is satisfied with second-hand tools, for which there is a fair demand, the sales of used tools probably being as large in volume as the sales of new tools.

Manufacturers of heavy machinery report some improvement in the outlook. Some fair inquiries are pending, but prospective purchasers are very slow in placing orders. Builders of coal handling machinery notice considerable improvement in inquiries, and some coal companies that have been holding off until general conditions showed an improvement are expected to place orders soon for coal handling plants. The demand for cranes is still light. The jobbing foundry situation shows no improvement, orders being for small lots of castings for immediate needs. Dealers in mill supplies report their orders very light.

The Western office of the Waterbury Farrel Foundry & Machine Company, Williamson Building, Cleveland, reports an improvement in its orders for special machinery and that its sales during May were larger than during any previous month since last August. With a fair run of inquiries and prospective orders that have not yet been closed up, the company expects a very satisfactory volume of business during June.

Bids were received by the Osborn Engineering Company, Cleveland, on June 6, for the erection of two large buildings for additions to the plant of the American Seeding Machine Company, Springfield, Ohio. One will be a foundry, one story, 200 x 200 ft., and the other a three-story manufacturing building, 50 x 250 ft.

The Long Arm System Company, Cleveland, has secured contracts to equip three battleships, now under construction for the American Navy, with power doors, and that department of the company's plant is now running to full capacity.

The McMyler Mfg. Company reports an improvement in inquiries for coal handling machinery, and expects to secure some good sized orders for that class of machinery within the next few weeks.

The Fixler Trolley Stand Company, Delta, Ohio, has been formed, with a capital stock of \$25,000, to build trolley pole stands for cars. C. R. P. Waltz is president; Dr. A. M. Wilkins, vice-president; J. M. Longnecker, treasurer; J. H. Gehring, secretary, and D. H. Lavenberg, manager.

The Carnahan Stamping & Enameling Company, Canton,

Ohio, has increased its capital stock from \$300,000 to \$500,000.

The Peerless Match Company, Akron, Ohio, and the Rockford Match & Machine Company, Rockford, Ill., have been consolidated and the Peerless Company will be reorganized, with a capital stock of \$150,000. It is the intention to establish a plant at either Akron or Cuyahoga Falls for the manufacture of matches and match making machinery.

The Lyman Mfg. Company, which will start a plant in Warren, Ohio, for the manufacture of pails, has been incorporated, with a capital stock of \$20,000, by E. M. Lyman, A. J. Lyman, M. E. Lyman, W. G. King and Harvey L. Williams.

F. H. Froehlich, consulting engineer, Toledo, Ohio, has been engaged to prepare plans for an electric light and power plant in Bucyrus, Ohio. The city has not yet decided whether to build its own plant or to sell the franchise to a private corporation.

The Wooster Machine Company, Wooster, Ohio, has been incorporated, with a capital stock of \$25,000, by E. E. Porter, Elmer S. Lands, J. E. Schultz, Nick Amster, E. O. Dix and Wesley Zaugg.

The Board of Trustees of the Massillon State Hospital, Massillon, Ohio, will receive bids until July 9 for mechanical stokers for one Heine 400-hp. boiler and two Bonus 350-hp. boilers.

The National Nut & Bolt Lock Company, Cleveland, Ohio, will erect a new building for the equipment of which it will require a gas engine, electric generator, punch presses and other machinery.

### New England Machinery Market.

WORCESTER, MASS., June 9, 1908.

The machine tool trade shows no improvement. Comparatively few machines are being sold. There are instances of spasmodic changes for the better, but usually the improvement does not endure. Some of the manufacturers are feeling preliminary effects of machinery lists which Western railroads have put out, or which it is known will be issued shortly. The machinery builders report that inquiries are taking the more active form of personal visits to works to look over tools. It is generally accepted as probable that of the large amount of new business which for months past has been in evidence for the future there should be a constantly increasing percentage of culminations in the form of orders. The usual answer to questions to manufacturers as to the condition of their business is that it is dull, but that the prospect looks brighter. The reasons given for believing in this change are, however, still somewhat theoretical. Reports received from various sources abroad do not show any marked change from the dullness which came coincidentally with that of the United States.

The Boston machinery dealers find things almost as quiet as at any time since the first of the year. With the advancing of June there would normally come the beginning of the summer slackening of activity, and when the change is from a stagnant market the effect is striking. The slight spurt of May would naturally disappear unless some new influence should assert itself, and to date no such influence has been noted, nor is it expected for the present. It is accepted by practically every one that nothing radically different from present conditions is to be anticipated before the fall months, but at the same time there are many believers in a gradual strengthening of the market even in the face of the hot weather.

General manufacturing presents all degrees of activity from actual paralysis to full production. Certain seasonable lines are very busy. Reports from the cotton industry, some of the paper mills and some of the shoe manufacturers indicate that there is a stronger demand for these great staples. Other industries that have had their season are dull. Such a one is the wire fence and poultry netting trade. The wire business as a whole is showing few signs of increasing prosperity. But while no figures are available it looks as if manufacturing as a whole in New England is somewhat more prosperous than at any time this year. And underlying the whole industrial structure is a feeling voiced by many business men that the worst is over. The crop reports; the optimism voiced in the daily press from men whose opinions are looked upon as worthy of consideration; the maintenance of prices in most lines; the constantly improving condition of the money market, are all entering into the foundations of this expression of confidence. The bond houses, which have been notorious pessimists, are now talking favorably. The highest classes of bonds are having ready sale, and the industrials are looked upon as soon to find a responsive market. The situation is sprinkled indiscriminately with the cheerful and the depressing, with a growing percentage of the former.

The shop vacations which have become a fixed custom with a great many manufacturing works in New England will probably be longer than usual this summer. Announce-



ments of their dates are already being made, conveying the idea that there will be a lengthening out, unless business improves in the meanwhile.

The revival in the automobile industry, already noted, has become very marked, and manufacturers all over the country are regretting their action in reducing the season's output, which resulted from a belief that they faced a serious falling off in demand. Some of the large companies have sold the last machine of the 1908 model and could sell a good many more. One such reduced the product from the 1800 originally planned to some 1400. Now the works are running day and night, and this is not an exceptional case. The trade in the West is buying some machinery, a condition which was not anticipated by any one. As a consequence of this revivifying experience it is believed that the companies will plan for a generous product for 1909, and that in preparation for it some degree of benefit will accrue to the machine tool trade.

In this connection it is interesting to note that the receivers of the Pope Mfg. Company, Hartford, Conn., are petitioning the court for permission to proceed with the product of 1909, their estimate being 700 automobiles and 50,000 bicycles. In the petition it is stated that all of the machines built for this season have been disposed of.

Satisfaction is expressed over the announcement that the proposed general advance in freight rates by the railroads of the country will not become operative for the present, in the belief that the time is not ripe for such radical action. This is only a postponement, however, and not an abandonment of the plan. Theoretically all will suffer alike as between competing interests in business, but there will be accentuation of the fact that those producers who are distant from any given market must be at greater expense than those who are nearer.

It is stated that the Conant & Donelson Company, Greenfield, Mass., manufacturer of dies, has decided not to move its business to Turners Falls, Mass., which had been contemplated.

The Stratton Rotating Engine Company, Fitchburg, Mass., builder of a new rotary engine, is selling its machine tools and other equipment, and states that hereafter it will have its product manufactured by outside parties.

The authorization of an issue of \$7,000,000 in bonds of the Boston & Albany Railroad for general improvements on its system will result in large expenditures for miscellaneous equipment, though it is not understood that new shops will be included, excepting such as are necessary in connection with roundhouses. Among the items specified are new engine houses and additions, \$1,149,000, including one at Rensselaer, N. Y.; coaling and water stations, \$52,500; automatic signal systems, including 30 new interlocking towers, \$77,850, and third tracking, \$1,022,800.

The Central Tool Company, Providence, R. I., has been organized under Rhode Island laws with a capital stock of \$10,000, to manufacture tools, the nature of which it is not yet ready to state. The incorporators are Arthur P. Mowry, Louis S. Moulthrop and Fernando O. Jaques, Jr., all of Providence.

An important street railroad scheme, of which the New York, New Haven & Hartford Railroad is to be the backer, was divulged in a bill before the Massachusetts Legislature asking for the right to build four new trolley lines in western Massachusetts, at a cost of \$2,000,000, the work to be completed inside of two years. The most important line will connect the towns of Lee and Huntington, a distance of 19 miles, to cost \$915,000; while a line from Great Barrington to Egremont will cost \$635,000. A line to the summit of Mt. Greylock, the highest point in the State, is estimated to involve an expenditure of \$450,000. The bill would consolidate the Bennington & North Adams Street Railway Company with the Berkshire Street Railway, which is owned by the New York, New Haven & Hartford interests, and which will make the extensions if the bill becomes a law.

Charles W. Arnold, Haverhill, Mass., has begun the erection of a new factory building at Lynn, Mass., which will be rented for general manufacturing purposes. It will be 99 by 111 ft., and six stories, though in the beginning only a single story will be erected, to be extended upwards as space is desired by tenants.

New England has a good deal of interest in the attempt at reorganization of the business owned by the Hardware & Woodenware Company, formerly the National Novelty Corporation, many of whose plants are located in this territory. An offer for the company's property has been made the receiver, and the matter will come up for consideration before the court this week. These factories are now practically idle, and their reopening for business would have an influence on the welfare of a number of communities.

The New England Transportation Company, Portland, Maine, is planning to establish a shipyard at Providence, R. I., and move its business to that city. The city of Providence has been asked to grant a lease of its land situated on the Seekonk River, and the matter is still in abeyance. William H. Reed is president and Wilbur F. Dresser treasurer. The business was formerly conducted by the Casco Shipbuilding Company. A specialty is made of schooners up to

five masters. The plan is to build a mill for sawing frames and a blacksmith shop at the new yard.

The Page-Storms Drop Forge Company is about to move from Springfield, Mass., to its new works in the nearby city of Chicopee. The new plant is a model of its kind, consisting of six buildings, including drop forge shop, 60 by 200 ft.; machine shop and finishing building, 50 by 163 ft., three stories; annealing house, 40 by 70 ft., and power house in which is installed a producer gas engine unit capable of developing 300 hp.

## Cincinnati Machinery Market.

CINCINNATI, OHIO, June 9, 1908.

In summing up results for the month of May, and in a comparison with those of the month immediately preceding and for the third month of the year, most tool concerns in this field find that March and May were about equally productive in business and inquiries, with April showing in a few cases a considerable decrease, in others 10 to 15 per cent. While not discussed openly or even very aggressively, the action of some concerns in making special prices on late specifications from such railroads as are in the market has received the attention of large manufacturers who are committed to price maintenance, and the action was generally condemned. Most manufacturing concerns report conditions unchanged and announce that they do not expect any kind of general buying before the first of the year.

Machinery sales agents visiting this section from other fields report the outlook much better, with some sales which would have been an utter impossibility early in the year.

The unheralded visit to this market of a representative of the Government last week who made some inquiries and special observations in the tool districts, has had an encouraging effect with manufacturers who have filled Government specifications in the past, undismayed by the official red tape and tedious trend of negotiations. It is reported that one requirement for planers alone footed up \$92,000, and that lathes, shapers, drills and other tools were on the list. Manufacturers visited are reticent and are unwilling to give out any details. Manufacturers of electric power machinery report conditions greatly improved; there is a good inquiry for small and medium sized units, and some sales are being made of the heavier machinery also, on which there has been but little inquiry for some time.

The idea of the National Prosperity Association, which has made splendid progress here, is being taken up by manufacturers generally throughout this district, and these are lending their support and co-operation. In a special circular just sent out broadcast the statement is made that 50 of the progressive industrial organizations representing over 12,000 employees are going to meet good times half way, and will increase their forces on July 1, to be called "re-employment day," in some instances to their normal payrolls.

The jobbing foundries are slowly emerging from their apathetic conditions, and the melt is being increased slightly. One of the largest local foundries which has been running a couple of large heats a week—65 or 70 tons—will change its cupola to accommodate 12 or 15 tons a day, distributing the work over five days a week, believing the change will prove beneficial to the men and not inimical to the business. The foundries making small castings are without exception very busy, with prospects good for a continuance.

The National Machine Tool Company, Cincinnati, is in the hands of a receiver—Dr. W. R. Thrall, who has just been named by the United States District Court. The business has been under the control of Charles F. and Walter P. Dolle, who control the stock. The receiver was named on the application of the Bollman & Wilson Foundry Company, a creditor.

The two concerns known respectively as the Ohio Bevel Gear Company and the Cincinnati Gear Works, have been consolidated, and are now doing business under the new management, at 120 Opera place, occupying half of the fourth floor of the power building at that number. Philip Fosdick is president; John Christensen, vice-president; Charles A. Stub, secretary, and John Clairmont, treasurer. These, with S. J. Sorenson, constitute the Board of Directors. The new concern reports business in its line improving, with a good local output of its specialty, which is used largely in the manufacture of lathes, drills, and the like.

The Steptoe Shaper Company reports a fairly good week with some appreciated orders from abroad, including a 20 in. and a 24 in. crank shaper, both with automatic down feed and automatic circular feed attachments; one from Melbourne, Australia, a 24 in. triple gear, and also some single machines for domestic shipment, a couple—a 16 and a 20 in. back gear crank shaper—going to Chicago.

The Long & Alstatter Company, Hamilton, Ohio, has not, so far, noticed the ill effects of the early year depression, having had some good orders ahead for special machines of its manufacture—power punches and shears, tire welding machines, &c. A big multiple punch weighing about 80,000 lb., built for a large Chicago concern, delivered recently, has

a steady run of 75 days before it, working on sheet steel perforation. The adjustment is very fine, so gauged as to run 82 strokes a minute, punching 98 holes at each stroke through 16 gauge steel sheets 48 in. wide. Another special tool built by the Long & Alstatter Company is a special gate shear with a cut of 16½ ft. through 5-16 in. material. This machine weighs about 35,000 lb., and was delivered in Ohio. An order in the shops is for a big bending machine to bend 24-in. I beams, for one of the Ohio bridge building companies. It is a 30,000 lb. machine. For another concern the company is working on a heavy tire welding machine to weld 6 x 1 in. and 5 x 1¼ in. heavy tires and axles, with a speed of 80 per minute, and is said to weld as fast as six fires can heat. Another machine ready for delivery is a big cross cut shear to cut 4 in. square and 4½ in. round. The variety of demand as witnessed by this concern argues a general brightening of the industrial horizon, according to Secretary C. E. Macbeth.

The Hooven, Owen, Rentschler Company, Hamilton, Ohio, manufacturer of Hamilton Corliss engines, is operating on a 45-hr. per week schedule, and compared with the state of activity in the same line of plants in other parts of the country should have no special complaint. Just now the company is busy finishing a municipal order, the power equipment for the new water works and electric light plant of the city of Hamilton. One 500-kw. and one 300-kw. cross compound condensing engine have already been installed, and a 200-kw. of the same type will be placed within a month. The 6,000,000-gal. pumping engine built by the company has also been placed. The city is spending about \$75,000 on the plant.

In the iron department at the Fred J. Meyers Mfg. Company, Hamilton, indications point to gradually increasing activity with an early resumption of normal conditions. This department is working on a 54-hr. per week schedule; other departments 9 hr. a day, with half holiday on Saturday. The wire goods department, according to President Fred J. Meyers, shows for the five months about 15 per cent. decrease in volume of business as compared with 1907, but is about even with 1906. The Meyers Company has made a splendid record during the months of depression; not a single man has been laid off, and, anticipating the opening of the fall trade in July, it is expected that an additional force will have to be employed. President Meyers is one of the aids to the prosperity movement, and has a very fair sized part of the Simmons Hardware Company's million dollar order sent out June 1.

At the plant of the Hamilton Foundry & Machine Company, East Hamilton, the small castings department presents a busy scene. Almost a normal force in this department is working on full time, 60 hours, but exclusively on miscellaneous small castings. The other plant owned by officers and directors of this plant—the Sohn & Rentschler Company—is still busier, if anything, on the same general line of work, and working on full time, with a full force.

President Hilker of the Hamilton Machine Tool Company, Hamilton, has a firm and abiding faith in the quick recuperative qualities of the American public—industrial and commercial—and is a loyal believer in a fine shop and office organization to take care of changing conditions.

During the recent depression the Bentel & Margedant Company, Hamilton, developed a new and improved line of railroad and car shop woodworking tools and is preparing to bring out a new catalogue. The factory is working on a five-day, 8-hr. schedule, and with about a two-thirds force.

President O. N. Ritchie of the Advance Mfg. Company, Hamilton, has been out on a little trade jaunt, feeling the commercial pulse. The company's line of gas and gasoline engines, from 1 hp. to 35 hp., is now quite complete, and Mr. Ritchie, who is a firm believer in the country's ability to recover quickly from little trade worries, has prepared to push his company's products to the front in an aggressive and progressive manner.

Lintz Brothers, proprietors of the Fort Branch Machine Works, Fort Branch, Ind., have secured the contract for furnishing eight steel bridges for Centre Township, that county.

The Buckeye Traction Ditcher Company, Findlay, Ohio, has made some heavy shipments of ditchers the past few weeks and reports improving conditions.

The Chamberlin Cartridge & Target Company, Findlay, Ohio, reports some good sized shipments to interior points and to Canada of targets and target throwing apparatus, averaging recently about eight cars a week.

Wickes Brothers, Pittsburgh, dealers in machinery and electrical equipment, report business in their line greatly improved. They recently placed the boilers and some machinery in the Keystone Nail Company's new plant in Rochester, Pa.

The city of New York has found it cheaper to purchase electric current than to generate it, and the municipal lighting plants for the Brooklyn and Williamsburg bridges have therefore been shut down.

## Government Purchases.

WASHINGTON, D. C., June 9, 1908.

The Isthmian Canal Commission will receive bids until June 29, Circular No. 446, for a quantity of supplies, including class 1, two water tube boilers and one stack breeching, with necessary pipe and fittings; class 2, four engine lathes; class 3, four sliding head upright drill presses; class 4, four back geared shapers; class 5, four water tool grinders; class 6, 18 air hammer rock drills; class 7, 12 rock drills; class 8, eight long stroke riveting hammers and spare parts and two pneumatic wood boring machines and spare parts.

Bids will be received until June 18, at the office of the Building for National Museum, Library of Congress, Washington, D. C., for engines and dynamos for the new building.

The Isthmian Canal Commission will soon ask bids for two 75 hp. direct current shunt wound open type motors for the La Boca machine shop.

The Bureau of Yards and Docks, Navy Department, Washington, has completed plans and specifications, and will shortly ask bids for a coaling plant, coaling pier and other work at the Key West Navy Yard. About \$200,000 will be spent on this work. Plans have also been completed for a marine railway at Key West.

The following bids were opened June 2 for machinery for the navy yards:

Class 11.—Four screw cutting lathes—Bidder 90, Fairbanks Company, New York, \$835, \$865 and \$795; 106, Garvin Machine Company, New York, \$725 and \$620; 124, Hendey Machine Company, Torrington, Conn., \$882; 170, Manning, Maxwell & Moore, New York, \$785; 205, Pratt & Whitney Company, Hartford, Conn., \$1172.

Class 21.—Two electric motors—Bidder 87, Fisher Electrical Works, Detroit, Mich., \$2299; 108, General Electric Company, Schenectady, N. Y., \$1681.15; 299, Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., \$1728; 304, Western Electric Company, New York, \$1711.30; 315, Burke Electric Company, Erie, Pa., \$1501.

Class 31.—Two radial drilling machines—Bidder 83, Frevert Machinery Company, New York, \$1749; 89, Fairbanks Company, New York, \$1628; 106, Garvin Machine Company, New York, \$1570; 128, Hill, Clark & Co., Philadelphia, Pa., \$1714; 170, Manning, Maxwell & Moore, New York, \$1960; 185, Niles-Bement-Pond Company, New York, \$1719; 204, Vandyck-Churchill Company, New York, \$925; 317, Dezouche, Hanson & Co., Philadelphia, Pa., \$1752.

Class 32.—One cutter and reamer grinder—Bidder 25, Becker-Brainard Milling Machine Company, Hyde Park, Mass., \$550; 29, Brown & Sharpe Mfg. Company, Providence, R. I., \$284.07; 84, Fairbanks Company, New York, \$590; 185, Niles-Bement-Pond Company, New York, \$275, \$298 and \$715; 203, C. T. Patterson Company, New Orleans, La., \$774.

The following bids were opened June 2, Circular No. 441, for machinery for the Isthmian Canal Commission:

Class 1.—One turbine pump—Bidder 28, Blackall & Baldwin Company, New York, \$6370; 55, D'Olier Engineering Company, Philadelphia, Pa., \$9240, \$9270 and \$8774; 57, Drummond, McCall & Co., Montreal, Canada, \$6000 and \$4360, price based on entry duty free; 152, Watson-Stillman Company, New York, \$4575 and \$4660; 160, Henry R. Worthington, New York, \$7286.32, \$7710.10 and \$7616.84; 162, Alberger Pump Company, New York, \$5970.

Class 2.—Two duplex water pumps—Bidder 55, D'Olier Engineering Company, Philadelphia, Pa., \$940; 66, Fairbanks, Morse & Co., Chicago, Ill., \$830; 74, Gardner Governor Company, Quincy, Ill., \$760; 102, Manning, Maxwell & Moore, New York, \$815.49; 106, Motley, Green & Co., New York, \$825; 108, National Electrical Supply Company, Washington, D. C., \$829; 160, Henry R. Worthington, New York, \$728.98.

Class 3.—One power hammer—Bidder 21, Beaudry & Co., Boston, Mass., \$690; 65, Fairbanks Company, New York, \$656; 68, Fox Bros. & Co., New York, \$707.85; 87, International Electric & Engineering Company, New York, \$732.50; 102, Manning, Maxwell & Moore, New York, \$660; 115, Niles-Bement-Pond Company, New York, \$730 and \$698; 125, Prentiss Tool & Supply Company, New York, \$690.

Class 4.—One interchangeable crane and buggy geared ladle—Bidder 68, Fox Bros. & Co., New York, \$225.25; 73, G. & W. Mfg. Company, New York, \$213; 102, Manning, Maxwell & Moore, New York, \$225; 154, Whiting Foundry Equipment Company, Harvey, Ill., \$260.

Class 7.—One large pneumatic sand shaker—Bidder 40, Chicago Pneumatic Tool Company, New York, \$80; 77, Hanna Engineering Works, Chicago, Ill., \$180 and \$125; 160, Henry R. Worthington, New York, \$192.72.

The following bids were opened by the secretary of the Department of Agriculture, Washington, D. C., June 2, for the installation of machinery and the completion of a portable refrigerating plant for the bureau of plant industry:

Penn Engineering Company, Philadelphia, Pa., \$5300. Wilmington Machine Company, Wilmington, Del., \$7145. Dickerman & Yeakley, Philadelphia, Pa., \$7400.

Under bids opened April 21 for machinery for the navy yards, the General Electric Company, Schenectady, N. Y., has been awarded, class 121, two turbo generator sets, one motor and one switchboard, \$9705.

The offices and works of the Hadaway Electric Heating & Engineering Company, some time since acquired by the Westinghouse Electric & Mfg. Company, have been removed from 238 West Broadway, New York, to the works of the electric company at East Pittsburgh. This change will permit the business to be carried on upon a much larger scale than formerly. A New York office will be maintained on the twenty-second floor of the City Investing Building, 165 Broadway.



# HARDWARE

**T**HE adjournment of Congress without action upon the pending bills relating to pure Paint naturally suggests questions as to the status of the matter, and especially as to the significance of the failure of either House or Senate to consider measures which at a comparatively recent date seemed to be in a fair way of enactment. The failure of these measures does not, however, mean their abandonment, but simply that the developments of the final fortnight of the recent session were such as to make it impracticable to secure action in either house before adjournment, and it was therefore decided to put the subject over until next winter. In view of the occurrences of the past season it is hard to forecast the disposition or the action of Congress when the matter comes up again.

The course of things at Washington in connection with the efforts to enact the laws in question furnishes indeed a curious commentary on the vicissitudes of legislation and the danger there is that undigested and unwise laws will be passed, even after careful consideration by the committees of the House and Senate, with public hearings to ascertain the views of the trade. At one time the Paint manufacturers were practically a unit in favoring a pure Paint law, but at the end they united in opposing any such legislation. For it will be remembered that when the pure Paint bills were pending the Senate Committee on Manufactures gave an extended hearing early in May to prominent representatives of the Paint trade, nearly all of whom were manufacturers. But, with the exception of a delegation of master painters who strongly favored the pending bill, all present not only opposed the proposed legislation, but any measure whatever dealing with the subject of pure Paints! The pending bill, introduced by Senator Heyburn of Idaho, chairman of the Senate Committee on Manufactures, was strongly objected to, first, because it required the manufacturer to print his formula on the package; and, second, because its provisions were extended to Varnishes, Japans and Dryers, the chemical composition of which, it was declared, could not be ascertained by any known method of analysis.

The probability seems to be that the representations made to the Senate Committee at the hearing referred to have been so far convincing that the Heyburn bill will probably be amended in two important particulars, namely, the requirements regarding the placing of formulas on packages will be eliminated, and Varnishes, Japans and Dryers will be exempted from the operation of the proposed law. As thus modified, the bill will provide merely against misbranding and will be denominated an "honest Paint" bill rather than a "pure Paint" bill. Under its provisions a manufacturer will not be required to make any statements whatever upon his labels unless he elects to do so, but he cannot make a false statement thereon without subjecting himself to the penalties provided by the bill. While the Paint manufacturers as a class are opposed to any legislation, they are on record as declaring that they will not attempt to obstruct the passage of a bill which merely prohibits false branding, and while such a measure falls far short of the desires of the master painters and of not a few merchants, yet it is probable that this is as far as Congress can be induced to go in what must be regarded as an experimental and somewhat questionable field of legislation.

## Condition of Trade.

The event of greatest importance in the week under review is the concerted reduction in prices by the great Steel manufacturers, which was determined on Tuesday evening. Whether or not this cut will give consumers of raw material and the trade generally confidence in the market remains to be seen. In this decline Wire Nails and Wire products participated, the reduction of Nails being 10 cents from the recent schedule price of \$2.05, which was, however, to a certain extent nominal. The change is thus a very moderate one and will disappoint the expectations of those who were looking for a more radical cut. It may, however, be regarded as an indication of the conservatism of these great interests which has characterized their management of the situation thus far. The question of principal interest in this connection is the effect on the market of the abandonment of the policy of maintaining prices at the old level, and whether or not this action will stimulate purchasing by the merchants and great consumers. Since the open reduction in the price of Steel Bars the trade has been in a waiting attitude, and business in general has probably fallen off rather than increased. This matter is of interest in the Hardware field in its relation especially to the opinion of the trade in regard to the extent to which existing prices are likely to be maintained. While it can be argued on the one side that the decline which has occurred is small and does not greatly change existing values of material in hand, and has thus only a slight and indirect bearing on the cost of the finer finished products, the point may, on the other hand, be made that the trade will be disposed to consider the possibility that there may be further recessions, unless orders for the cruder products are promptly attracted by the change which has been made. Many, however, will welcome this change as a move in the right direction. Meanwhile the news from the agricultural sections of the country is singularly encouraging, and the indications point to fine crops at good prices. If these hopes are realized even in good part the effect should be quickly felt all along the line. The first half of the year thus draws to a close with conditions which, whether or not in themselves altogether satisfactory, undoubtedly indicate progress toward commercial and industrial improvement.

### Chicago.

June is not a month, even in normal times, when an expanding volume of business is looked for in Hardware lines, and it is hardly to be expected under existing conditions that the present month will prove exceptional in this respect. That the past week has not developed any signs of increasing activity and has, if anything, disclosed a tendency toward more pronounced quietness in some lines is not regarded as significant of general retrogression, and is therefore not disappointing in the sense of defeated expectations. Preparations for the coming harvest are now occupying the attention of farmers, from whom there is now but little demand for goods other than binder twine and other accessories directly connected with the gathering of crops. On this account the consumption of Nails, Fencing Wire and the cheaper lines of Builders' Hardware has fallen off, and, in consequence, replenishing orders for these goods from retailers have declined both in number and volume. But the promise of abundant crops that will soon be convertible into cash at good prices is an element of strength which serves as a founda-

tion for hopes of future reaction that will go far toward restoring trade to a basis of something like normal activity. Doubt as to the successful maintenance of prices, especially of the heavier staples, such as Bolts, Nuts, Wire Nails, Fencing and other Steel goods, has been emphasized by the reduction of \$4 a ton on Steel and \$3 a ton on Iron Bars, announced last week by the leading manufacturer of these products. Until fully assured that prices of finished products, more or less nearly related to these materials, will be sustained at somewhere near the present level, buyers will doubtless be disposed to continue to hold their purchases closely within the limits of actual immediate requirements. The hope is entertained that after the first of July the railroads will buy more freely, and in view of their long continued policy of retrenchment, it is believed that their storehouses are practically bare of supplies. Even if they come into the market for only a modest portion of their needs the effect will be sensibly felt in swelling the aggregate volume of business. Houses carrying Heavy Hardware are anticipating the early entry into the market of the implement makers, who are already making inquiries concerning their wants for the coming season. These inquiries have grown more numerous in the past few days since the revision of Steel and Iron Bar prices were announced, and it is evident that the concessions offered will result in a better movement. Whether the basis established will be generally regarded as acceptable for the conclusion of the usual yearly contracts remains to be seen.

### NOTES ON PRICES.

**Wire Nails.**—Since the recent reduction in the price of Steel Bars and small shapes there has been a feeling, more or less general, among the trade that reductions in other Steel and Iron prices might follow. Reductions in Wire Nails and other products were decided upon Tuesday evening by the manufacturers who have been working together in maintaining the market. The new price for carloads to jobbers for Steel Nails is on the basis of \$1.95, usual delivery and terms, or a reduction of 10 cents per keg from the late established quotation. A good many Nails had, however, been sold "on old orders" at \$2.00, so that the decline is from 5 to 10 cents per keg. Whether the reduction in the price of Wire Nails is calculated to remove doubt as to the immediate future of the market and to open the way for placing more liberal orders remains to be seen. Quotations for base sizes are as follows, f. o. b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.95
Carload lots to retail merchants.....	2.00

**New York.**—The improvement in the local demand is slight and yet it is noticeable. Merchants who continue buying in small lots to cover only immediate requirements would without doubt purchase more liberally if prices were reduced so that they could feel confidence in the market.

**Chicago.**—Few new orders are being entered, the demand being now limited to small lots required to meet present requirements. Dealers, both retail and wholesale, are not carrying more stock than is necessary to supply the current demands of the trade and at this season consumption is much reduced. There is a general feeling of apprehension that prices may recede from the present level and on this account there is no disposition to accumulate stocks.

**Pittsburgh.**—Those who have been arguing that on account of some improvement in the general conditions in the Steel trade the manufacturers of the raw material might decide to stand pat on the policy they have pursued for so long and not make any reductions, have been disappointed in view of the announcement of reduced prices on Wire Nails and other products. During the past week the demand has been very light, calling only for occasional small lots, the trade holding up orders as long as possible in view of the chance of a reduction in price.

**Cut Nails.**—The market continues without improved

demand, orders being confined to actual requirements, which are exceedingly light. The market is irregular, and concessions are being made on regular Steel Nail quotations, so that about \$1.80 for carload lots at mill is more representative of the market than \$2.05. Iron Nails generally should command about 10 cents more than Steel. It remains to be determined what effect the decline in Wire Nails will have on the Cut.

**New York.**—The demand is comparatively light in proportion to that for Wire Nails. Nail houses are holding Steel Cut Nails on the basis of \$2.15 per keg for small lots at store.

**Chicago.**—The demand continues extremely light. No orders for lots of considerable size are being entered, either by the mills or jobbers. Stocks of the latter are moving very slowly, necessitating infrequent orders for replenishment. Both mill and store prices are irregular and what are recognized as regular prices are being freely cut. Chicago quotations are nominally as follows: In car lots to jobbers, Iron Cut Nails, \$2.18; Steel, \$2.03; in small lots from store, Iron Cut Nails, \$2.30; Steel, \$2.15.

**Pittsburgh.**—New demand is confined entirely to very small lots for actual needs, and orders are few and far between. No general improvement in demand for Cut Nails can be expected until there is betterment in the whole situation, and renewed activity in building operations. We quote Steel Cut Nails at \$1.80, but as low as \$1.75 has been done on only carload lots. Small lots are held at \$1.85 to \$1.90, at mill. Iron Cut Nails are about \$1.85, at mill.

**Barb Wire.**—There has been only a limited demand. The advanced stage of the season and the uncertainty as to the course of prices are influences which have united in curtailing the volume of business in this line. A reduction of 10 cents per 100 lb. was made Tuesday in the price of Barb Wire, Painted and Galvanized, the new price to jobbers in carload lots being now \$2.10 for Painted and \$2.40 for Galvanized, f. o. b. Pittsburgh, 60 days or 2 per cent. for cash in 10 days. The price to retailers is 5 cents additional.

**Chicago.**—So far as new orders are concerned there is very little doing. Farmers in all sections of the country are too busy with crops to devote attention to fence building. Shipments of fair volume against contracts are still going forward from the mills, but until fall buying begins nothing more than desultory orders are expected.

**Pittsburgh.**—Practically no new business is being placed, only an occasional order for a small quantity being received by the mills, jobbers and small dealers holding up any tonnage they have as long as possible, until it is known absolutely whether prices will be reduced. It is expected that within 24 or 48 hours definite announcement will come as to a reduction on Wire products.

**Plain Wire.**—A reduction of 10 cents per 100 lb. was made in Plain Wire, as in Wire Nails and Barb Wire, by the manufacturers at their conference on Tuesday. This makes the base price to jobbers in carload lots \$1.80 for Plain, and \$2.10 for Galvanized, f. o. b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days. The price to retailers is 5 cents higher.

**Chicago.**—Manufacturers of Fencing and other Wire products are still confining their orders to actual needs, which almost without exception are very meager. There is no incentive to purchase ahead of present requirements, as the general tendency of values is downward, rather than the reverse, and the feeling prevails that cheaper prices must rule.

**Pittsburgh.**—Demand is only for very small lots and few new orders are being placed. The trade is holding back orders until it is known absolutely whether a reduction will be made in prices. The leading Steel interests are expected to make an announcement about prices within a very short time.

**Belt Lacing.**—Considerable irregularity has been observed recently in the market for leather Belt Lacing. As might be expected, however, weakness is most pronounced in the cheaper grades and leading manufacturers state that there is little or no change in their stand-



ard lines. They also express the belief that prices cannot long remain on the present level in the face of the strengthening leather market. The market on competition goods may now be represented by a quotation on cut Lace of 60 to 60 and 10 per cent. discount, and on Sides of 20 cents per sq. ft.

**Spring Balances.**—Quotations recently sent out by leading manufacturers of Spring Balances show a decline approximating 10 per cent. on the general line. The market may be represented in a general way by a discount on light Balances of 60 to 60 and 5 per cent.

**Shot.**—Manufacturers of Shot have sent out the following reduced schedule of prices, effective June 8, representing a decline of 5 cents per 25 lb. bag on all grades except dust Shot, which remains unchanged:

Drop Shot, sizes smaller than		
B .....	25-lb. bag, \$1.80	5-lb. bag, \$0.40
Drop Shot, B and larger sizes.	25-lb. bag, 2.05	5-lb. bag, .45
Buck and Chilled Shot.....	25-lb. bag, 2.05	5-lb. bag, .45
Dust Shot.....	25-lb. bag, 2.30	5-lb. bag, .50

On ton lots these prices are subject to a discount of 10 cents per bag of 25 lb.

**Rope.**—Conditions remain practically unchanged, and the moderate demand emphasizes the fact that there is no snap to the market. The following quotations, for base sizes of Rope, fairly represent the market for small lots, but are not always adhered to: Pure Manila, 10 to 10¼ cents; lower grades Manila, 8 to 9 cents; Pure Sisal, 7½ to 7¾ cents; lower grade Sisal, 6½ to 7 cents; No. 1 Jute, ¼-in. and up, 6¼ cents; No. 2 Jute, ¼-in. and up, 5¾ cents.

**Window Glass.**—The demand from hand blown factories is reported as continuing light, while Glass is being turned out in excess of what is required. It is understood that half a dozen or more factories have gone out of blast for the summer, but it is estimated that there is still operating from 900 to 1000 pot capacity, most of which will continue in operation till the last of June. Some factories may operate throughout the entire summer.

Quotations vary considerably, both from jobbers' and manufacturers' lists. From jobbers' list prices range from 90 and 30 and 10 to 90 and 40 and 5 per cent. discount on single, and on double strength from 90 and 40 to 90 and 40 and 10 per cent. discount. More general quotations are 90 and 30 and 90 and 40 per cent. discount for single and double strength. Carload lots from manufacturers' list have been quoted from 90 and 40 to 90 and 40 and 5 per cent. discount for single, and 90 and 40 and 10 to 90 and 50 per cent. discount for double strength. More general quotations are 90 and 40 and 90 and 40 and 10 per cent. discount for single and double strength. The present prices of Glass are considered by manufacturers of hand blown Glass as ridiculously low, and as having been caused by a total disregard of the simple laws of supply and demand. The optimistic view of the Glass situation by a large hand blown manufacturer is that the Window Glass business is on the eve of a great change for the better. Prices, it is said, have never been so much of a bone of contention between hand blown interests and the company operating machines as the period of production. The latter has insisted on operating continuously throughout the year, regardless of the laws of supply and demand, and has doubtless reasoned it would thereby reduce its cost by so doing. The hand blown factories have not been carefully organized and have hitherto had a flat scale to pay workmen. When prices were reduced to a point below cost by the machine blown interest the hand plants had to cease operations. But hand plants now have a flexible labor scale, and the recent cuts made by the machine people have not had the same effect upon hand plants. In view of the ability of the hand plants to meet all cut prices by the machine interest the carrying of surplus stock has fallen upon the latter, as hand blown Glass is preferred in all markets at the same price. It is therefore regarded as not unreasonable to believe that a shut down will be forced on the machine interest, and the dealers who have leaned upon them to fill their requirements through the summer will be found short. Hand blown Glass manufac-

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turers generally are following the prices made by the machine interest, and in some cases without restricted specifications. Window Glass workmen in some Glass making districts are regarded as feeling that the machine interest has for the last few years forced them out of business when the weather began to get warm and that this put the machine interest in a position to sell Glass while the hand blown factories were idle. The workmen are said to fully realize their condition and are willing to do anything to improve it. Some manufacturers think that the machine interest will advance prices about July 1, as present prices mean a loss to hand factories, and it is regarded by hand blown manufacturers as doubtful whether the machine interest can show any profit on its product.

**Paris Green.**—Orders by merchants which had been on the manufacturers' books, were practically all shipped by June 1. Since that time the weather has not been conducive to the development of Potato Bugs, therefore duplicate orders have not been forthcoming. Materials entering into the composition of Green are lower than in 1907, when manufacturers placed their orders, so the price of Green is not likely to be advanced. The desire to protect customers who have placed orders for the bulk of their season's supply, will probably deter manufacturers from lowering prices. Therefore it is anticipated that prices will remain steady. Quotations are as follows:

	Arsenic	175	28-56	2 & 5	Boxes.	Boxes.	Boxes.
	kegs.	lb.	lb.	lb.	1-lb.	½-lb.	¼-lb.
10,000 lb. and over...	21½	22	23	23½	24½	25½	26½
5000 to 10,000 lb.....	22	22½	23½	24	25	26	27
1000 to 5000 lb.....	23	23½	24½	25	26	27	28
500 to 1000 lb.....	24	24½	25½	26	27	28	29
Less than 500 lb.....	25	25½	26½	27	28	29	30

**Linseed Oil.**—Deliveries on contract orders are continuous, and a limited amount of business has been done in single carloads for delivery through July. Orders for small lots, covering immediate requirements, represent market conditions more accurately. Local quotations are as follows: State and Western Raw, 42 to 44 cents; City Raw, 44 to 45 cents per gallon. Boiled Oil is 1 cent per gallon advance on Raw.

**Spirits Turpentine.**—The market in the South has been strengthened by heavy buying for export, at the low prices which have ruled. In the local market business has been moderate, as demand from manufacturing interests has been light, and buyers generally have little confidence in the stability of the market. As a result of fluctuations during the week, the local market is higher. The New York market is represented by the following quotations: Oil Barrels, 44 to 44½ cents; Machine Made Barrels, 44½ to 45 cents.

## THE HOT SPRINGS CONVENTIONS.

(By Telegraph.)

The eighteenth annual convention of the Southern Hardware Jobbers' Association, the semiannual meeting of the American Hardware Manufacturers' Association and the ninth annual convention of the Arkansas Retail Hardware Association were opened simultaneously at Hot Springs, Ark., on Tuesday morning under conditions of weather highly favorable to the comfort, pleasure and profit of those in attendance.

The two bodies first named held their opening session co-jointly in the assembly room of the Arlington Hotel, while the latter meeting was held at the Majestic Opera House nearby. Despite the remoteness of location from the larger industrial centers of the North and East there were present at the joint session of manufacturers and jobbers about 250 members, and the meeting of the State retail dealers also opened with a good attendance, in which practically every part of the State was represented.

The morning was occupied by all three associations mainly with the preliminary work of organization, which included addresses of welcome and greeting and the appointment of convention committees. Executive sessions were held in the afternoon by each of the three bodies. At the meeting of the jobbers and manufacturers reports of various standing committees were presented and acted upon. A highly satisfactory degree of harmony in the

relationship of these interests was disclosed in the reports. Discussion of matters relating to transportation in the Jobbers' Association revealed no important grievances against the railroads or other carriers. The consideration in detail of the Executive Committee's report was deferred until a later session.

The real work of all the associations will begin on Wednesday morning, when the attendance will doubtless be augmented by new arrivals and instructive and entertaining programs will be taken up by each organization. Entertainment features have not been overlooked by those in charge of arrangements, the first being a reception and ball given Tuesday evening at the Arlington Hotel.

## A STEREOPTICON WINDOW DISPLAY.

BY FAR WEST.

A WINDOW trimmer is sometimes perplexed as to ways of displaying the same goods time after time. The change of seasons, with the consequent change of goods, affords a great relief, and the manufacturers are also coming to his aid with pictorial helps. By using these helps the stereopticon window is made. A rather small window is best for the purpose, and one that has sash at the back without mirrors. Mixed Paints, Varnishes, Enamels and the great variety of Stains on the market serve admirably for the display.

### After the Window is Cleaned

fasten the border the manufacturer sends around the top, sides and bottom of front glass with either stickers or a touch of liquid glue. The border usually has some figure in bright color on white, the particular one in mind has a small figure holding a Paint Bucket in one hand, while the other hand points toward the center of the window. Next fasten directly in center of glass a small figure containing a good deal of color, as one of the rosettes sent to finish the corners of the border. Raise the bottom of the window to a level with the top of border by placing boxes of suitable height or boards resting on boxes, covering them with some light colored material, manila wrapping paper serving very well.

### Going Outside and Looking In

we find a bright border, with balance of window in shadow. If the sides are painted a light color they should be hung with dark cloth, also if the sash is filled with anything but glass, black cloth should hang over it. The bright border accentuates the gloom of the bare window. Now place in front, close to the glass, but with space of an inch or so between, small cans of Enamel or Varnish with bright covers. Back of them arrange the cans in pyramid shape by using half gallon cans as base; on these a quart can, then a pint and so on, being careful to keep plenty of space between each pyramid. Take gallon cans for trimming the sides, rising in steps. On top of each pyramid place a Paint Brush.

At the back suspend one of the lithographs showing a house with proper combinations of color for painting. When you look into the window now you will find the bright colored packages stand out against the shadow or black cloth, as the figures do in a stereopticon.

THE first annual edition of the Sporting Goods Trade Directory has lately been issued by the Sporting Goods Publishing Company, St. Louis, Mo. The directory presents a classified index of the goods made by Sporting Goods manufacturers and a list of Sporting Goods jobbers and manufacturers' agents. A copy of the book will be sent to each subscriber to the *Sporting Goods Dealer*.

The H. G. Lewis Hardware Company, Portage, Wis., has been incorporated with a capital stock of \$7000, to deal in Hardware, Stoves, Ranges, Sewing Machines, Paints, &c. The officers are: H. G. Lewis, president; C. J. Kutzke, vice-president; H. Senger, secretary.

An explosion of oil recently caused serious damage in the store of Fred J. Hibbs Company, Bridgeport, Ohio.



## MINNESOTA RETAIL HARDWARE ASSOCIATION.

**A**BOUT 70 per cent of the Hardware merchants of Minnesota are now affiliated with the association in that State. The map presented herewith indicates the towns in which this large and very successful association has members. It will be observed that the association idea has penetrated practically to every part of the State. Among the larger cities St. Paul and Winona appear to be the only ones in which the value of the State organization has never been fully appreciated. While Minneapolis has a very good local organization and has learned and profited by the benefits derived from associated effort, the twin city of St. Paul has never had very much of a city association, and at the present time has nothing of this kind. For some unknown reasons the Hardware merchants of Winona have always fought shy of the State Association, and at the present time only one firm in that city is a member. With these exceptions the association is thoroughly representative of the State.

The membership of the association is now well on the way to the 900 mark, the increase in number during and since the annual convention held in February approximating 50. Among the new towns which have thus been added to the association realm are the following: Myrtle, Manchester, Hayward, Zimmerman, Kent, Elba, Kandiyohi, Alvarado, Okabena, Kinbrae, Greenbush and Montrose.

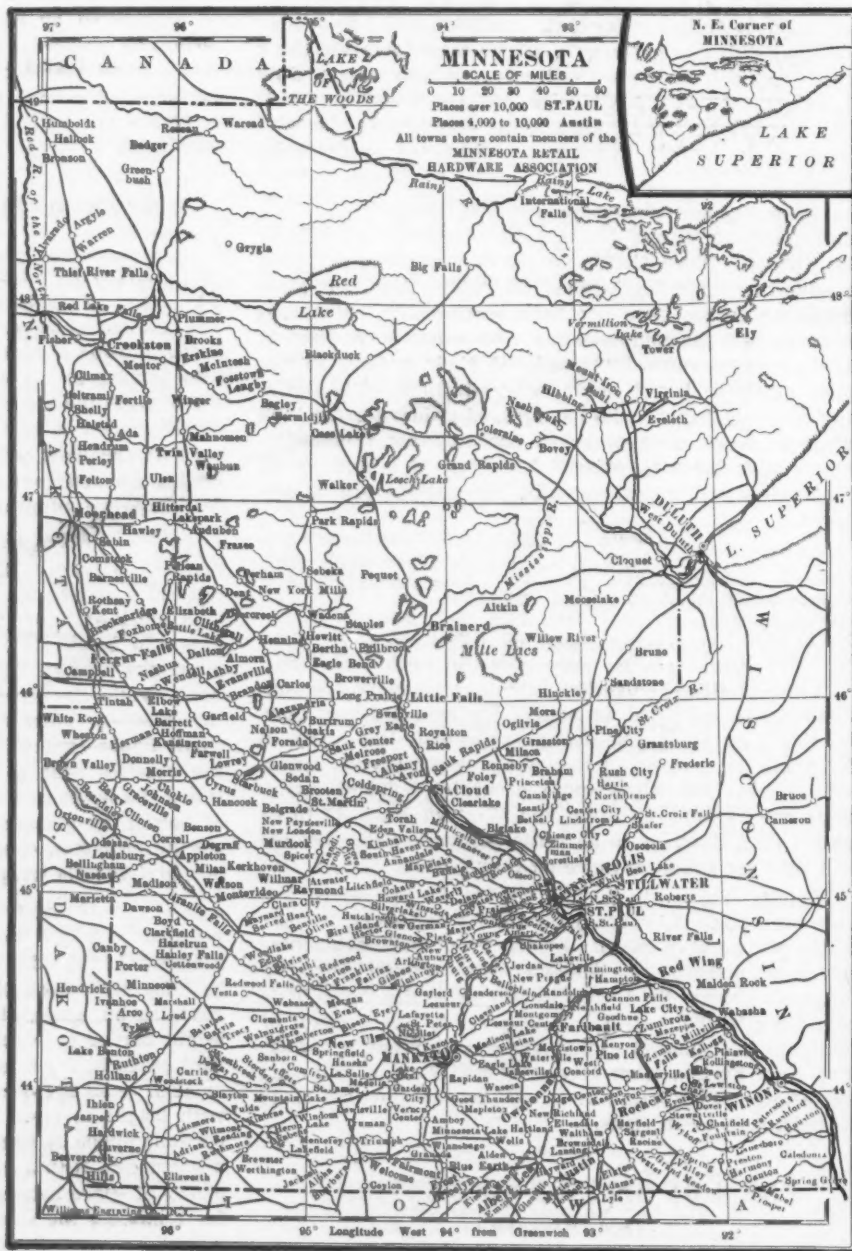
While the association thus includes quite a large proportion of the total Hardware merchants of the State, no effort will be spared to induce many of those now outside the fold to become affiliated with the organization and share directly in its benefits. It is planned to send out circular letters to every Hardwareman in the State, members and nonmembers, about every 60 days, making as strong an appeal as possible to the latter, with a view to adding them to the membership roll. We understand that each of these letters has thus far brought in a few accessions.

In addition to the regular stock arguments of unreasonable competition between local merchants, the catalogue house proposition and threatened parcel post legislation the State Association of Minnesota presents a very strong financial inducement to Hardwaremen in the saving secured by its members by insuring with the Minnesota Retail Hardware Fire Insurance Company, the pioneer company of this class, the return premium amounting this year to 50 per cent. The limit of risk is now \$5000, having been raised from \$3000 several months since.

The able secretary of this large and influential organization is M. S. Mathews, Guaranty Building, Minneapolis, who occupies a similar position with the insurance company.

## The Iron Age Directory.

**N**OTWITHSTANDING the painstaking care and effort which characterizes the compilation of "The Iron Age Directory," it is perhaps to be expected, in view of its great scope and detail, that errors will occasionally crop up. It is pleasant to record, however, that during



*Hardware Association Map of Minnesota, All the Towns Indicated Containing One or More Members of the State Organization.*

the years of its publication remarkably few breaches of accuracy have taken place, and the book as a whole has been especially free from errors of any kind.

We regret that through a clerical error the name of the Alaska Freezer Company, Winchendon, Mass., was omitted under the head of "Freezers, Ice Cream," in the 1908 edition of "The Iron Age Directory" lately sent out to our subscribers.

The address also of the American Spiral Pipe Works, Chicago, whose name appears under Fittings, Flanges, Forgings, Pipe, &c., should have been changed to Forty-eighth avenue and West Fourteenth street, that city, where they are now located. We will ask the trade to note the above and make appropriate correction in the Directory.

Reed & Wyman Company, San Diego, Cal., has succeeded Pierce-Field Hardware Company, the change being one of name and not of proprietorship.

### Wisconsin Retail Hardware Association.

THE Wisconsin Retail Hardware Association, of which C. A. Peck, Berlin, is the energetic and efficient secretary, has just issued a folder, under date June 1, entitled "Information of Interest to You," in which the attention of members of the association and others is effectively called to association matters. The Executive Committee held a meeting in Milwaukee on the 20th ult., at which it was decided to adopt a trademark for association use, which is reproduced herewith. The folder refers to "some of the work done" at the meeting in the following entertaining vein:



To have the association manage the exhibit feature next winter.

To admit traveling representatives of legitimate jobbers and manufacturers of Hardware and kindred lines to associate or honorary membership upon the payment of \$1 per annum, and furnish them with the *National Bulletin* and admit them to all the privileges of the association except attendance at executive sessions.

To adopt a distinctive trademark. See first page. How do you like it?

To try and have the constitution amended next winter so that the last three ex-presidents shall constitute an advisory board.

To plan some work on desirable lien and garnishee laws for our members of Legislative Committee to "get busy" on.

To have a bi-monthly circular issued to every Hardware dealer in the State.

The Milwaukee local association presented a resolution against fake advertising, and the secretary was instructed to try and get the National Association interested and at work for the passage of a law by Congress "cutting it out."

Secretary Bruce of the Merchants' and Manufacturers' Association, who is chairman of the Building Committee of the new Auditorium, was present, and felt safe in assuring us that the new Auditorium would be ready in advance of our next annual.

Some complaints were presented, and discussed, cussed and recussed.

Other paragraphs of a general character in this catchy circular are as follows:

This is a good time to get after some of those slow accounts.

You have probably learned that Parcels Post legislation is effectually killed for this session of Congress.

Let us work unitedly for—

1. One-cent letter postage;
2. Abolishing post office box rent.
3. Against fake advertising.

We claim credit for the association for the defeat of Parcels Post, abolishing of billboard ads. on freight cars, distribution of catalogues by railroad agents, putting sale of fixed ammunition to Gun clubs on a remunerative basis.

If you have a competitor who is not a member of the association, can't you get him interested? It will make him a better competitor. Try it.

We have 687 out of 950, but want 800, and can get them, with your help.

On the last page, under the head of "Go Out After the Trade," several pointers are given:

The proprietor can do more to increase his trade out by the front entrance with a smile and a glad hand than he can back in the office.

Several dealers hold a weekly meeting of an hour, talking over any items of interest with their clerks, porters and tin shop force.

Where your contractors get into the habit of dropping in is the place where they will likely leave their orders.

It is planned to issue these circulars every two months and judging from the initial number they should prove effectual in interesting the members in association work and gaining recruits among those outside the organization. We have quoted at length from the folder in view of its general interest and perhaps suggestiveness to Hardware associations in other States.

### A Card Record of Petty Charges.

JAMES R. GLADWIN, a Hardware merchant of Westfield, Mass., employs an original and convenient method of recording petty charges. By this is meant charges against casual customers or against persons or firms who do not run an account because they purchase infrequently or regularly pay cash. In the bookkeeping department of the establishment a very simple and efficient system is employed for handling the regular open accounts, and the scheme of segregating petty charges above referred to was devised with the idea of keeping down the number of inactive book accounts and reducing transcription and unnecessary detail work.

#### A Card File.

The practice of the firm is merely to keep petty charges on cards, filing them under the name of the purchaser in an ordinary alphabetical index drawer. The appearance of the card and the form of entry is shown

1907	M <sup>rs</sup> Bagby	
Oct 22	11 Boxed Calks	\$1.37 1/2

Card Recording Transient Charge.

in the accompanying illustration. The number on file at any one time is never very large and it is an easy matter to run over them and follow up any that should be collected. When payment is received, the card is destroyed, or, if convenient, it is given to the customer as a receipt. These small items are considered as cash and so treated.

#### No Permanent Record

of such charges is kept, since, of course, there is no other entry made. This suggests that at times it might be inconvenient not to be able to refer back to find out what was purchased or what was paid for it. It is also possible that all records of a charge might be lost, through the accidental loss or destruction of a card on which an entry had been made. In practice, however, the firm does not find these considerations important. No card is known to have been lost since the system was put in operation. The file drawer is kept in the safe and is handled by only one man, so that the possibility of losing, misplacing or destroying the record of an unpaid charge is very remote. The advantages of the plan, as already brought out, are its simplicity, convenience of handling, economy of time and labor and the reduction of the number of inactive book accounts.

The H. F. Hobbick Company, Winchester, Ind., incorporated with a capital of \$6000, has been organized to handle Hardware in a wholesale and retail way, the stock including Stoves, Tinware, Wire Fence, Pumps, Cutlery, Sporting Goods, &c. The company will also give attention to plumbing, hot water heating, furnace work, roofing, cornice manufacturing, &c.

THE E. S. BRACE COMPANY, Niagara Falls, N. Y., has been incorporated with a capital of \$35,000 to manufacture Carpenters' Braces and other tools. The officers of the company are G. M. D. Heard, Painesville, Ohio, president; J. F. Ziefang, Niagara Falls, vice-president, and John Goffin, Niagara Falls, secretary and treasurer.



## HARDWAREMAN MARKELL'S EVERY DAY ALPHABET.

JACOB MARKELL, Greenport, N. Y., handling Hardware, House Furnishings, Yacht Fittings, &c., is the author of the Hardware alphabet reproduced herewith. It was first published in the local paper, occupying a full two-column space, which permitted prominent display and attracted much attention. Subsequently, Mr. Markell issued the alphabet in the form of a folder, for general distribution to his customers and others, whom he desired to interest in his store offerings. It will be observed that the matter is presented in a very catchy fashion and that a multiplicity of Hardware and related goods are pleasantly and effectively treated. Under the head of letters Q, U, X, Y and &, the opportunity is em-

## ACCEPTING BUSINESS AT A POSITIVE LOSS.

BY H. N.

SOME time ago I heard of a "business" transaction in which a Hardwareman figured disastrously, although he seemed to feel that the circumstances justified his course of action. It is well for him that all his business clients are not built on the lines of the purchasing agent against whom he was pitted. This merchant was endeavoring to sell goods to a mill whose purchasing agent said that he was in the market for Sandpaper. The merchant did not remember the discount on Sandpaper, so, returning to his store, found he could buy it at 60, 10 and 5 per cent. Once more he goes to the mill and finally, after much figuring, gets the order for 5 reams

## MARKELL'S Every Day Alphabet.

- A** For Axes for Woodmen and Leaven, the very best make, As Sifters, "The Hunter," for that "takes the cake," Awls and Augers, will bore the hardest of wood, Alvah, who'll serve you as none other could.
- B** For Baskets and Brushes and Brooms, every kind, Braces, Bells and Bits, the best you can find, Bolts, Brackets and Bevels to fit every case, Butts, Boat Hooks and Blind Pans, will hold them in place.
- C** For Carpenters' Tools, every pattern and make, Compasses, Cleavers and Chains you can't break, Carpet Stretchers and Beaters that do a neat job, Coat Hooks, Casters and Coal Hods and Mason's Plumb Bob.
- D** For Door Knobs and Door Locks and Door Springs as well, Door Hangers and Drawer Pulls and Dust Pans to sell, Drills, Drawing Knives, Dead Locks to make doors secure, Dusters, Dray Hooks, Dividers, the mechanic's ally.
- E** For Egg Beaters, Escutcheons, End Cutters and End Color Chalk, Enamels and Eilers for trimming your wall, Fry Pans of all sizes, both Agate and steel, Engineer's Lanterns, Eel Spears never pass.
- F** For Fishing Tackle, the best, that is sure to catch Fish, Food Choppers, Forks, Files and Fine Chaffing Dish, Fry Pans of all sizes, both Agate and steel, Fruit Pickers, Foot Warmers, Fly Killers, all real.
- G** For Garbage Cans, Glaziers' Points and Glass Cutters too, Grindstones, Grass Hooks and LePage's strong Glue, Gimlets and Goggles and Grass Shears galore, Great variety and quality not shown here before.
- H** For Hammers and Hatchets and Hinges and Hoes, Hay Racks, Hair Clippers and Hooks for your clothes, Harness Snaps, Harness Hooks and Hitching Rings, too, Hunking Pins, Hammock Hooks and Hamps, not a few.
- I** For Ice Cream Freezers, Ice Chisels and Ice Tonges as well, Ice Picks, Ice Boxes and Ice Shavers to sell, Irons and Ironing Boards to smooth out your clothes, Ice Creepers, to help you walk when the wind blows.
- J** For Jingle Bells, Jack Planes and strong Jack Chain too, Jacks for wagons and Auto's, we want to sell you, January, June or July, any month you may try, Jacob Markell is here and of him you should buy.
- K** For Knives for Pocket and Carving and Butcher and Kitchen, Kid for Scallops and Oysters, cut bait when you're "Bullish," Key Rings, Key Blanks and Keys for your door, Key Checks, Keyhole Saws, Knobs to screw in the floor.
- L** For Lawn Mowers, Lawn Sprinklers, the best that are made, Levels, which every carpenter must have for his trade, Lamp Chimneys, Wicks and Lanterns, to light the dark way, Locks for Chests, Doors and Wardrobes any kind that you say.
- M** For Mallets of Hickory or Fibre, in shape, square and round, Mangers of iron for stable, the best to be found, Manila for Ship Carpenters, will be found very good, Measures, all sizes in Tin, Agate or Wood.
- N** For Nails, Wire, Boat Cut, Galvanized or plain Steel, New, Tacks and Shoe Nails, Brass and Copper, the real, Night Latches and Neckties, will hear much abuse, Needles, both for Bagging and Sailmakers' use.

- O** For Oars, Oarlocks and Oil Cans, every kind you can catch, Oil Heaters, Oil Cook Stoves and Ovens to match, Oil Stoves for sharpening the Carpenters' tools, Oh! I had almost forgotten those Chalk Line Spoils.
- P** For Paints, sold in cans, all ready for use, Pickaxes, Pliers, Planes, Powder and Fuse, Pokers and Pallets, Picture Wire and Hooks, Pouches, Poultry Netting for service and looks.
- Q** For Quality, you'll find the very best here, Quantity also, you need never fear, Quit settling away for things you can buy Quite as cheap here if Markell you will try.
- R** For Revolvers, Rules, Reamers and Rollers for Sash, Razors, both Regular and Safety—but not any trash, Refrigerators, Upright and Ice Box as well, Rakes, Ringbolts and Rat Traps, known well.
- S** For Saws, Sawbucks, Saw Sets, Shears and Scissors, all new, Scythes, Sash Cord and Sash Fastenings and Sprinkling Pots too, Skates, Screw Drivers, Shovels, Shacksies and Squares, Screens for Windows and Doors, and Shelf Brackets in pairs.
- T** For Twine, Tea Kettles, Tea Pots, Agate, Nickel and Tin, Thermometers, Tape Measures, Thumb Latches to let you right in, Trowels for Masons and Garden, Turnbuckles as well, Transom Lifts, Tubing and Small Table Bell.
- U** For Useful is everything that we sell, Unless you trade here you will not do as well, Unusual is the word most applied to our stock, Unless things are taboos. They won't sell on our block.
- V** For Vices, all sizes, complete your work bench, Very Convenient when using a wrench, Very tightly it holds when you once get a "biteh," Very generally used by the poor and the rich.
- W** For Wingers, Wash Boards and Tubs, both Metal and Wood, Wheelbarrows, Weather Strips which after years will be good, Wash Boilers, Wall Buckets and wrenches all kinds, Window Screens, Window Washers and Fastenings for your Blinds!
- X** For X-tra the quality of goods that we sell, X-cellent price we give you as well, X-cedingly prompt our deliveries are made, X-tortion we shun. Of your ill-will we're afraid.
- Y** For Your own home merchant will honestly try, Your confidence to win, and induce you to buy, Your interests and his are both centered right here, Yes, let us together begin the New Year.
- Z** For Zinc Binding for Oil Cloth, laid on your floor, Zinc Oil Cans on hand, you've had them before, Zeal in our business, or we'll not succeed, Z, the last letter we all learned to read.
- &** For & now, our brief story is most earnestly told, & to you we are thankful for goods we have sold, & hope you'll continue to be always our friend, & not take offense at the message we send.

Only a few of the items we sell, are named here, But give us a call and we'll make it clear, That our stock is complete and none can compare, We don't want it all, but we do ask our share.

**JACOB MARKELL,**

22 Main Street, Greenport, N. Y.  
Telephone 95-F-5, Greenport.

Hardwareman Markell's Everyday Alphabet.

braced to say something on quality, prices, prompt delivery of goods, co-operative interest between merchant and customer, appreciation of patronage extended, &c.

### Retail Hardware Conventions.

THE dates for the next annual convention of the Michigan Retail Hardware Association are August 12, 13 and 14, instead of August 13, 14 and 15, as published in a recent issue. The meeting will be held in Detroit.

Other retail Hardware conventions of the next two or three months are those of the Carolinas Association at Wrightsville Beach, N. C., on July 8, 9 and 10, and the Oklahoma Association at Oklahoma City, July 14, 15 and 16.

at 60 and 10 per cent., an apparent profit of 5 per cent. Now if this was No. 2 Sandpaper, listing at \$4.75, the entire order would be \$8.55, net, and the enterprising dealer's profit 43 cents.

In course of time the Sandpaper has been used, and the merchant seeks another order from the same mill. Meantime he hears that his competitor, who formerly had this trade, has received 10 reams of this particular Sandpaper. Knowing this fact, the Hardwareman calls up the purchasing agent, asking for another order. He is told "There is some one after your scalp; you must come down in your price." "Well," says the merchant, "I'll take the order at 60 and 10 and 2½ per cent." He gets the order, and the buyer adds, "That's the way to talk business."

### Pretty Poor Business for the Merchant.

Yes, it may be the way to "talk business," but its business for the sharp purchasing agent rather than for the enterprising Hardwareman. Its pretty poor business for the merchant, who gets the order this time at a gross profit of  $2\frac{1}{2}$  per cent., or about 22 cents, out of which must come his regular expense of transacting business—store rent, light and heat, freight and cartage, wages, postage, &c.—which probably amounts to at least 15 per cent. of his annual business, this bright transaction meaning a positive loss of more than a dollar.

The purchasing agent can't be blamed for buying his goods as low as possible; that's his business. He was a sharp buyer, and that is why he holds his job as purchasing agent. And when he can buy goods below the market it certainly is the way to talk business for him. But for the Hardwareman "talking business" in such a way demoralizes trade and breeds still more competition, and, perhaps, leads to bankruptcy.

### Position of the Competitor.

To carry this illustration to its logical conclusion, the Hardwareman who formerly had this mill trade in Sandpaper will in time find his competitor has secured the business. He has 10 reams on hand. As probably there is no other market for it, he will sell it to the mill at cost. This will bring the price down to 60, 10 and 5 per cent. Then both merchants will endeavor to buy Sandpaper cheaper—some jobber may try to help one out. The result is they all suffer a cutting down of a legitimate profit. It is just this foolhardy way of going after business that ruins many a merchant and brings premature gray hairs upon the head of the Hardwareman. Such methods should be discouraged, not encouraged.

The only possible excuse for a merchant taking business of this sort would be because he was securing with it a larger and more profitable trade in other goods.

For some business it is better for the Hardware dealer not to compete. It's better to let the mill supply house or the manufacturer sell Sandpaper direct rather than to handle the business at  $2\frac{1}{2}$  per cent. or even 5 per cent. It's far better to go without than to have business on which there will be a positive loss. Figure it as best you may, the fact remains true that just in the same proportion as such trade is handled will the Hardware retailer be worse off at the year's end.

### Rack for Handling Belting in Rolls.

THE NOVELTY IRON WORKS, Dubuque, Iowa, has in use a Belt Rack from which Belting can be conveniently reeled, as shown in the accompanying illustration, giving front and side views of the rack. Each compartment is  $\frac{1}{4}$  in. wider than the Belting that it is designed to accommodate. In reeling off the belt it is taken from the under side of the roll. Two notches in the partitions are made, so that the pins upon which the Belting revolves will not interfere with one another. Remnants may be kept on the top of the rack, and thus always in sight may be disposed of as opportunity offers.

Edward Hart Company, Gallup, N. M., has been incorporated with an authorized capital of \$100,000, succeeding to the Hardware, Implement, Vehicle and Sporting Goods business of Edward Hart. The latter is president of the new company and R. S. Platt is secretary and treasurer.

JOHN W. HUGHES, for many years agent for W. S. Butcher, Sheffield, England, has removed his office to 109 Duane street, New York, where he will carry a full line of Razors.

THE H. W. JOHNS-MANVILLE COMPANY, 100 William street, New York, manufacturer of Asbestos goods, &c.,

is opening a branch office at 30 South Pennsylvania street, Indianapolis, Ind., to take care of the local requirements of the trade in that territory. The office will be under the management of C. E. Wehr, who has for several years represented the company in that territory.

### The Value of Associations.

"YES," remarked the man, whose line was semiprofessional, "we have trade associations now, both national and State, but for a long time it was the hardest thing in the world to get the men together to consider the advisability of the association plan."

"That was unusual, wasn't it?" asked his companion. "In most lines of business that is considered a valuable trade asset, these days. An interchange of opinions and discussion of plans and policies has been the making of many a business I know of."

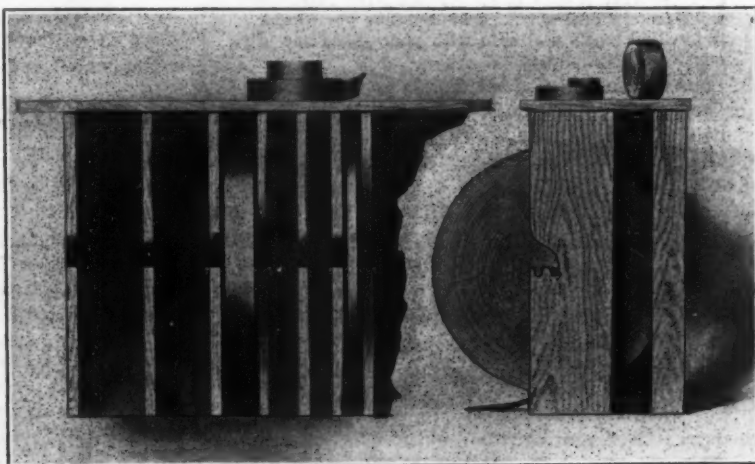
"That's just where the rub comes in," replied the first: "in our line there was formerly a great deal of jealousy, and I am sorry to say that many of us regarded our neighbors in the same line as robber barons. It was thought that the success or failure of the business depended entirely upon the owner's individual study and planning; that what he had thought out for his business was his personal property to which he should cling tenaciously, and any effort to form an acquaintance was regarded with suspicion that well nigh placed the inquisitor in the ranks of ordinary thieves."

"But haven't you made a practice of cultivating the acquaintance of your competitors and of visiting the out of town firms in your own line?" persisted the companion. "Surely your long and successful experience is not based entirely upon your own ideas and individual work. Life would be too short to build such an enterprise as yours under such close and hampered conditions."

"Well," replied the semiprofessional man, "I have been very active in helping to form our associations, and we now have fairly strong ones, but prior to the time that I made trips for this purpose I did not do much visiting. It would not have been permitted. I will say, though, that within the past five years I have been accorded a cordial welcome whenever I have called upon firms in this line."

"What brought about the changed attitude?" was the next question.

"Association conventions," was the terse reply. "I regard them as the greatest possible business helps. I have frequently made valuable acquaintances and obtained priceless ideas on these occasions that otherwise I should never have had."



Rack for Handling Belting in Rolls.

This is the gist of a conversation which recently took place in a New York City street car. The merchant was not a Hardware merchant, but his experience should interest Hardwaremen.

C. A. Fowler, De Witt, Neb., has sold his Hardware, Stove, Paint and Sporting Goods business to De Witt Hardware Company, C. A. Rowlinson, manager.



## LETTERS FROM THE TRADE.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### How the Catalogue Houses Jolly Their Customers.

*To the Editor:* Since there has been so much discussion during the past few years regarding catalogue houses and their competition, which has to a certain extent interfered with the legitimate retail dealer, I thought that it might be of advantage to the trade if they knew the methods by which some of the larger catalogue houses secure business. If a general knows the plans and the tactics under which his enemy is to advance he can better prepare himself for a defense; so that if we know their plans of getting business, we can better handle the "catalogue house customer."

In their letters to the trade, which are mimeographed, they make a personal appeal to the customer. When a customer is shown that this letter is a circular letter and is sent to all classes and kinds of people he at once loses the respect for them that he thought he had.

If you have never read one of these letters, it will pay you to get one. They are so full of deceit and so bold that it is astonishing how they can bring the desired results, but the catalogue houses have evidently studied the situation until they know just what kind of a letter it takes. Below are extracts from a letter sent out by a mail order house:

As a special favor to me, won't you please tell me on the inclosed card if we may expect an order from you this spring?

I am more than ever anxious to hear from every one of what we call our "A" grade customers, of which I am pleased to say you are one.

When a prospective customer is shown that this is simply taffy and that all their customers are "A" grade customers, since they have to send their money in advance, he weakens a little, and after these things are explained to him in a businesslike and diplomatic way about loses confidence in what the catalogues have said about the goods, and with confidence gone all is gone. The letter goes on:

I regret much that we cannot meet you face to face and know you personally as I would like to.

I do hope that you can send me an order amounting to \$5 or more, as I want to give your answer to this letter my personal attention.

Dear customer, if you will send me an order amounting to \$5 or more and send the order right away so that it will reach me not later than one week from Wednesday, I will see that your order is filled promptly and ship with your goods one of our latest big catalogues.

Of course this letter is not dated, so that at any time the order would be acceptable, and when the trade can be shown that these things are being worked on them they will get ashamed of giving their patronage to this kind of a house.

Of course circular letters are all right, but they should not be written with an idea of deceiving, and practices of this kind when run down will certainly revert to the legitimate retail dealer's advantage.

I also suggest that when any of our merchants are in a city where one of these houses is located he should call on them, not as a merchant but as a visitor, and if their experience is like the writer's they will become so much disgusted with the class of people in their employ and methods practiced that they can enthuse this disgust into would-be customers of the mail order houses.

This article is not written as a "cure all," for the conditions may be very different in other localities; but the writer has found this information to be of much advantage to him and hopes that it may be some to some fellow merchant.

MISSOURI.

WILLIAM M. SANFORD of Hannibal Green's Son & Co., wholesale and retail Iron, Steel and Heavy Hardware, Troy, N. Y., celebrated on the 19th ult. the fifty-second anniversary of his advent into that firm. Mr. Sanford, who was born in Bennington, Vt., October 7,

1838, and is still active in the management of the business, received the congratulations of many friends. The business with which Mr. Sanford became identified May 19, 1856, was originally established in 1809 by Jacob Hart and Henry Nazro, under the firm name of Hart & Nazro. On May 28, 1821, the partners separated, Henry Nazro continuing business by himself until 1832, when he formed a co-partnership with Augustus A. Thurber and Hannibal Green, under the style of Nazro, Thurber & Green. After the death of Mr. Green March 29, 1875, the firm became Hannibal Green's Son & Co., composed of Edward M. Green and William M. Sanford. The latter has been general manager since that time.

### Requests for Catalogues, Etc.

*The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.*

**REQUESTS** for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM CENTRAL SQUARE HARDWARE COMPANY, 974 Massachusetts avenue, Cambridge, Mass., which has lately been incorporated with a paid up capital of \$10,000. The company is successor to the business formerly carried on under the name of Edward T. Bynner, who is president. The business will be under the efficient management of Hiram W. Colton, formerly with Chandler & Barber and lately with the Burditt & Williams Company, both of Boston. The new company's lines include general Hardware, Cutlery, Paints and Oils, &c. Extensive alterations are now going on in the establishment, as a result of which the business facilities will be materially enlarged and improved.

FROM DAY & RICHARDSON, Monmouth, Maine, who have bought the Hardware, Stove, Implement and Sporting Goods business of F. K. Blake.

FROM WILCOX HARDWARE COMPANY, Waverly, Va., which has been incorporated with a capital of \$15,000. The officers of the company are J. E. Wilcox, president; J. E. Moss, treasurer and general manager, and E. N. Burt, secretary.

FROM G. A. LININGER & Co., who have succeeded to the Hardware, Tinware, Implement and Paint business of J. E. Englehardt, Accident, Md.

FROM J. R. SMITH, Mangum, Okla., who has succeeded Smith & Brown in the Shelf Hardware, Stove, Tinware, Implement and Sporting Goods business.

### Price-Lists, Circulars, Etc.

*Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.*

NEW CASTLE STAMPING COMPANY, New Castle, Pa.: Catalogue No. 5, for 1908, illustrating and listing Austrian blue and white and New Castle gray Enameled Ware.

EDWARD STINSON MFG. COMPANY, Baltimore, Md.: Price-lists No. 15 and 17 referring to Vehicle Wheels and Wheel material.

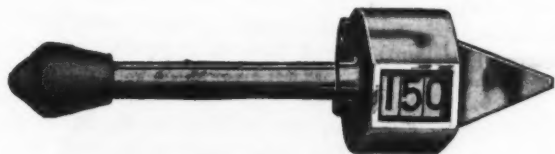
HARDINGE BROTHERS, 1034-1040 Lincoln avenue, Chicago, Ill.: Catalogues relating to the Beyer Watchman's Portable Time Clock and station, and to Cataract Precision Bench Lathes and attachments.

AMERICAN CARBON & BATTERY COMPANY, Signal Hill, East St. Louis, Ill.: Folders devoted to the company's American street railway Motor and Generator Brushes.

F. E. KOHLER & Co., Canton, Ohio: Illustrated price-list on Snow Shovels and Sidewalk Scrapers for the coming season.

### The American Vest Pocket Shaft Speed Counter.

The accompanying illustration shows a speed counter, not quite 3 in. in length, that registers the exact number of revolutions, only requiring one to take the initial reading and subtract it from the final reading of the

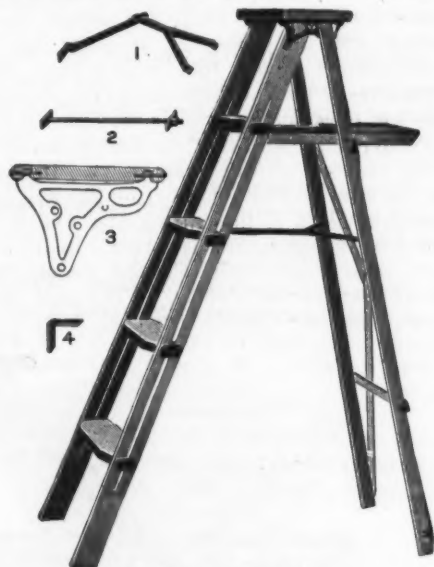


*The American Vest Pocket Shaft Speed Counter.*

machine. The device is referred to as being accurate and durable, and while very small and convenient to carry, is by no means fragile. It is offered by the American Steam Gauge & Valve Mfg. Company, 206 Camden street, Boston, Mass.

### The Unique Stepladder.

The stepladder herewith illustrated is made of Norway pine in the white, no yellow entering into its make up. No. 1 of the parts shown separately is a patented four-way brace, which firmly locks the legs when open; 2 represents an iron rod, which is placed under each step to prevent the stiles spreading; 3 shows a malleable fastener to and extending through the ladder to give



*The Unique Stepladder.*

it exceptional strength, while 4 represents the stamped heel fitted to strips and legs to prevent weather checks and splitting. The ladder is made by the Udell Works, Indianapolis, Ind., in 4, 5, 6, 7, 8, 9 and 10 ft. lengths, weighing, respectively, 12, 15, 19, 22, 25, 29 and 38 lb. Ladders are made in larger sizes also, under the names Excelsior and Anchor.

### Graduated Steel Rule with Equivalents.

The Lufkin Rule Company, Saginaw, Mich., and 280 Broadway, New York, has added to its comprehensive assortment of graduated steel rules one, the extreme dimensions of which are  $6\frac{3}{4} \times 1\frac{1}{8}$  in., the article itself having all right angles except at the top, which is rounded, with a 3-16 in. hole by which to hang it up. On one side it is graduated as finely as sixty-fourths and thirty-seconds of an inch to 6 in. On the same side there is a "Decimal Equivalent Table" ranging in inches from 1-64 in. to 63-64 in., and decimally from .0156 to .9844. On the reverse side of the blade a similar 6 in. measure by sixteenths is provided, with two columns of "Decimal Equivalents of Wire Gauges." In one column there is the number of wire gauge from 0000 to 40, inclusive, and in paral-

lel columns the American or Brown & Sharpe and Birmingham or Stubs' decimal equivalents.

### The Queen Corrugated Ash and Garbage Can.

A new form of ash and garbage can has been brought out by the Edwards Mfg. Company, Cincinnati, Ohio. The general appearance of the can and detail of its construction are shown in the accompanying illustrations. It is a combination of three pieces of sheet steel stamped into shape and galvanized after the parts are assembled. All joints are double seamed and locked to make them watertight, and the bottom, cover and body are all made from No. 21 gauge metal. The rim band is  $\frac{1}{4}$  in. thick. Special attention has been paid to give the structure of the corrugations such a form that, while they will be capable



*Fig. 1.—The Queen Ash and Garbage Can.*

of sustaining high stress on the outside, the interior surface is made of maximum smoothness to facilitate emptying the contents of the can. The lower end of the body is crimped, as shown in Fig. 2, and is set in a U-shaped flange at the bottom. The free edge of the bottom is pressed up over the shoulder of the crimping, and the bottom rim is thus formed of three thicknesses of steel. The top reinforcing band is driven inside the upper end of the can and rests against a shoulder, provided for it in the body. While being galvanized the cans are withdrawn from the coating pot in an upright position, causing the drip to run toward the base. The surplus metal drains through an opening left in the center of the bottom for the purpose, and after galvanizing this hole is



*Fig. 2.—Construction at Bottom of Can.*

capped, flanged and soldered. This method of galvanizing is pursued to give a heavier coating of zinc in the base, the wearing portion of the vessel, and a thorough filling of the joint crevices left as a natural result of construction. In other words, the intention is to have the lower end and bottom of the can with a thicker coating of zinc, where such a protection is most needed. It is made in three sizes, 15, 18 and 36 in. in diameter and all 26 in. deep.



### Herculever Case & Packing Box Opener.

The accompanying illustrations show a tool for removing the cover boards of packing boxes, cases, &c., which has just been put on the market by the Herculever Company, 332 Broadway, New York. It is described as a powerful, upwardly inclined lever having a piercing

claims that there is not a piece that will not bend double without breaking. The gear is made entirely of cold pressed steel, as are the axles and tongue. The wheels are made of steel and fully covered by patents. The company refers to its wagons as being durable, stronger and lighter for equal capacity than the ordinary wagon. They are further recommended as light of draft, handsome and

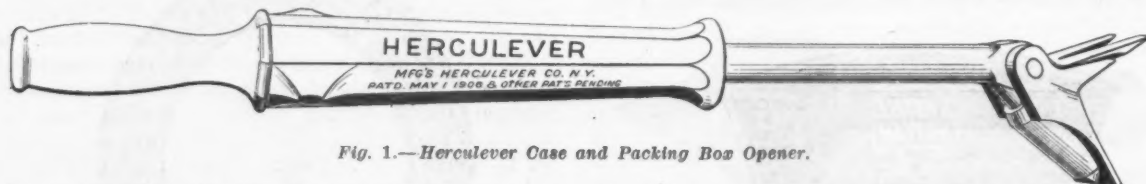


Fig. 1.—Herculever Case and Packing Box Opener.

and a lifting member fulcrumed to a bracket which also acts as a box or lifting fulcrum. In operation (Figs. 2 and 3), the piercing and lifting member is driven underneath the cover boards of the box by a sliding handle shaped weight on the lever. A bracket follows the piercing member under the cover board and rests on the end or side of the box when the depression of the lever resulting in the upward inclination of the lifting member causes the point of contact with the board to travel in a vertical plane, resulting in the maximum of lift with the minimum of travel, and enabling the operator to lift the

neat in appearance, convenient and not affected by heat, cold, or any climatic conditions.

### The Champion Floorscraper.

The Dosch Mfg. Company, Bridgeport, Conn., is offering the floorscraper shown herewith. The machine contains four knives with eight edges available for use before a new knife has to be inserted. The knives are sharpened on both edges and when one knife becomes dull the operator can reverse the handle and a new knife is ready. In this way all four knives and the eight edges can be brought into play. It is interesting to note that all the weight is around the knife, holding it right down to the floor. When pulling, the operator lifts the handle so that the wheels clear the floor about half an inch, and thus the benefit of every ounce of weight is obtained. The piece of steel between the knives has three uses: it acts first as a positive gauge for setting the knives, doing away with all guesswork or going by the eye. The knives are set so that they come within 1-32 of an inch of the edge of the chip breaker, as the steel is called, and since the jaws spring open as soon as the bolts are loosened it is readily seen that the knives can be quickly and easily inserted whenever necessary. In its second capacity this steel acts as a support for the knife, bracing the knife right down to the cutting edge and preventing the knife from springing or chattering. In its third use the steel acts as a means for releasing the shaving from the floor without leaving a ridge. When near the end of the cut the operator merely lifts the handle a little

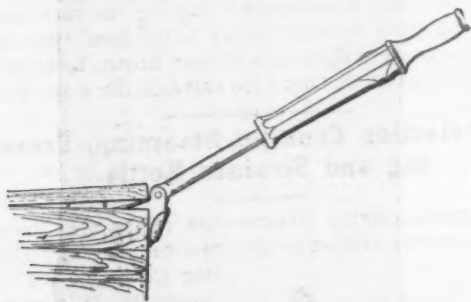


Fig. 2.—Herculever Box Opener in Operation—First Movement.

board and nails together. The piercing and lifting member is a forging made of 0.45 carbon open hearth steel, hardened slightly at the points and tested to meet the strain necessary under any conditions of operation. The fulcrumed bracket is also made of high grade steel, well finished, these two parts being held firmly together by a plunger spring device, and all assembled by a 1/4-in. steel rivet. The driving handle is made of the best grey iron



Fig. 3.—Herculever Box Opener in Operation—Second Movement.

casting and is assembled to the other two members by a pin similar to that used in the old style nail puller. The forward end of the handle, however, is said to be so designed that it cannot pinch the hand of the operator. The tool takes off a whole board at a time and should not be confused with a nail puller which removes one nail at a time. The makers claim that when properly used the Herculever leaves the board and nails in as good condition as it found them. If, however, any nails pull through the cover board and are left in the edge of the box, they can be readily pulled by reversing the tool and drawing the nail, as with the claws of a hammer.

### The Bruner Cold Pressed Steel Wagons.

The Bruner Steel Wagon Company, Wapakoneta, Ohio, has added to its product a full line of all steel log trucks and special heavy capacity wagons and trucks, ranging in capacity up to and including 15 tons, equipped either to be used with teams or in train behind traction engine. The high grade steel used in the construction of the goods is made especially for the company, which



The Champion Floorscraper.

higher and the shaving comes loose from the floor as the weight of the head is held by the chip breaker. One of the important features of the machine is that the handle is bolted solidly to the head, rendering the whole machine rigid. The handle is, however, adjustable to the height of any operator and yet the angle of the knife and head always remains the same. Twelve knives with 24 cutting edges are furnished with each machine. The knives are made of a very fine grade of steel and were selected by the company after a long search and many tests.

### Auger Bit and Chisel Sets in Rolls

The Simmons Hardware Company, St. Louis, Mo., has a new way of putting up Keen Kutter auger bits and chisels in sets, as shown herewith. They are referred to as especially convenient for carpenters and others who need to carry them about. Boxes containing such sets

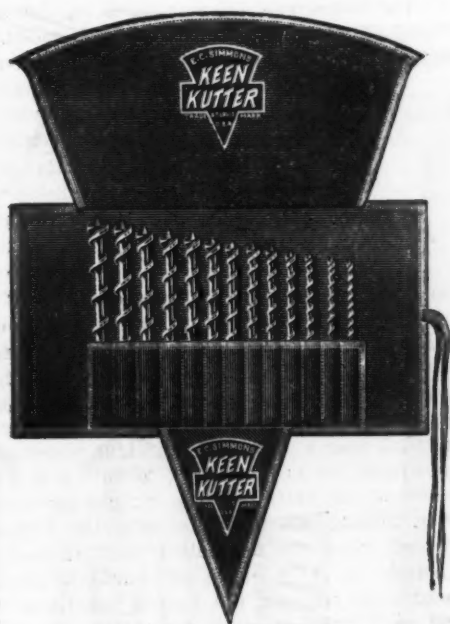


Fig. 1.—Set of 13 Keen Kutter Auger Bits in Roll.

are alluded to as being heavy and bulky, but the rolls are light and do not occupy much space in a tool kit. The auger bit roll is 11½ in. long and 3½ in. in diameter, and are made of heavy black duck with red binding. No. K S R 9 contains nine bits, one each—4, 5, 6, 7, 8, 10, 12, 14 and 16 16th; it weighs about 3 lb. No. K S R 13 contains 13 bits, one each—4 to 16-16ths, and weighs about 4 lb. The chisel roll is 10 in. long and 4 in. in diameter, and weighs with tools about 2 lb. No. E 5

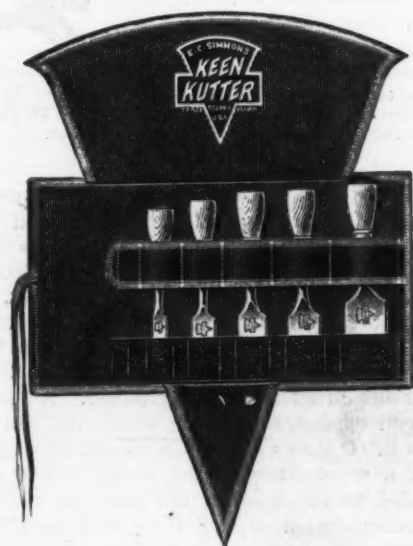


Fig. 2.—Set of Five Keen Kutter Butt Chisels in Roll.

contains five plain back butt chisels, one each—½, 1, 1¼, 1½ and 2 in. No. F 5 contains five beveled edge butt chisels, same sizes.

### Humane Cushion Heel Horseshoe.

The Humane Horse Shoe Company, Lima, Ohio, is putting on the market the cushion heel horseshoe shown herewith. It is made of approved horseshoe steel and furnished in regular sizes and half sizes up to 4½, light

or heavy web, and with high or low calks. The company's principal claim for these shoes is that by reducing the concussion of the horse's feet on hard surfaces they prevent soreness of tendons and tend to increase ma-



Humane Cushion Heel Horseshoe.

terially the usefulness of the animal. It is also urged that the shoes deaden the noise of horses' feet, prevent slipping on smooth pavements and on ice and remove danger of rotting or other injury to the hoof. The shoes are said to be very durable and easy fitting, being adapted to fit low plain or sharp ice calks to the same shoe.

### The Perfection Cooking, Steaming, Preserving and Strainer Kettle.

The accompanying illustrations relate to a cooking kettle put on the market by the American Specialty Stamp-



Fig. 1.—The Perfection Cooking, Steaming, Preserving and Strainer Kettle.

ing Company, Johnstown, Pa. It is made of enameled stamped ware of excellent quality, and is designed to prevent accidents resulting from draining boiling fluids from ordinary cooking kettles. The nesting arrangement is shown in Fig. 1; also the hook, opposite the spout, which catches the lid, when used for straining, making it impossible for the lid to come off. Before straining, the handle with the cover is pulled backward as far as the slot in

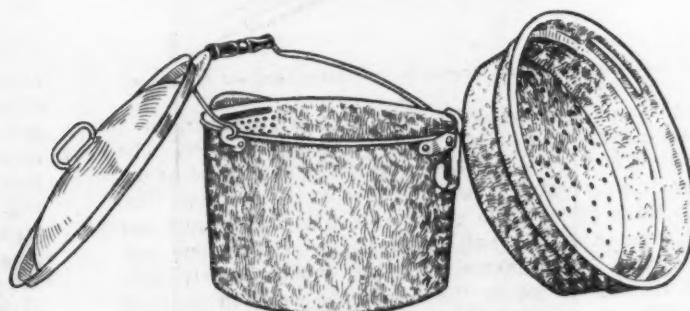


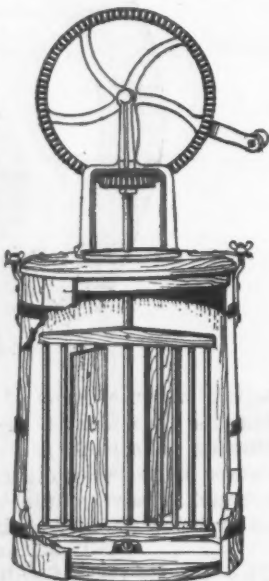
Fig. 2.—Parts of Strainer Kettle.

the safety ear will allow, when the opening in the spout is sufficient to allow the liquid in the kettle to drain out. This can be done, it is explained, without the slightest danger of the cook being scalded or burned, and none of the solid contents in the kettle can fall out. Among other points of excellence, the following are emphasized: That the steam can be let off without removing the cover; that all boiling liquids can be drained from the kettle without removing or holding the cover and that the cover can be kept on the kettle from the time the victuals are placed on the fire until they are cooked, and none of the nourishment can escape.



### The Dairy Queen Churn.

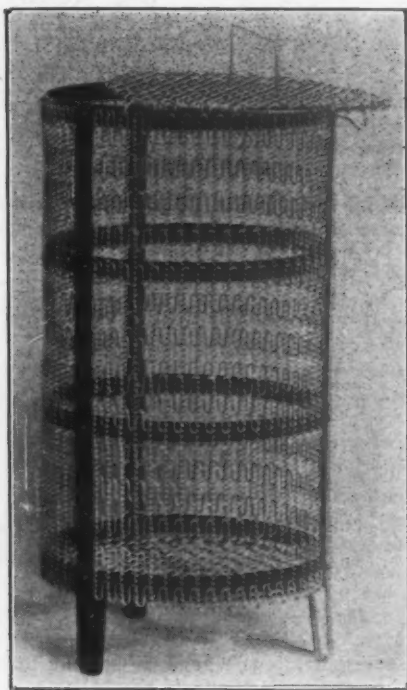
The latest addition to the line of churns made by the Dairy Queen Churn Company, Monmouth, Ill., is shown in the accompanying illustration. The body of the churn, which is designated as No. 0, is a heavy glass jar of 2 quarts capacity, and has an aluminum screw top with polished nickel gearing. It is built upon exactly the same lines as the larger wooden body churns holding from 3 to 8 gal. The dash which is made of clear birch wood is provided with sharp perpendicular bars, which are designed to cut the cream globules and let the grain of butter out intact. The dash also carries two perpendicular wings set at right angles with the bars, whose function is to drive a current of air through the cream. In churning the dash is reversed and, working back and forward, gathers and works the butter in a compact mass on each side of the dash. The lid being countersunk fits tightly into the mouth of the jar, and prevents splashing of its contents on the outside. None of the metal parts of the churn comes in contact with the cream. It is stated that butter can be made in 2 min., and the operation completed in 5 min.



*The Dairy Queen Churn.*

### The Standard Rubbish Burner.

The Standard Wire Company, New Castle, Pa., is offering the rubbish burner shown herewith. It is made

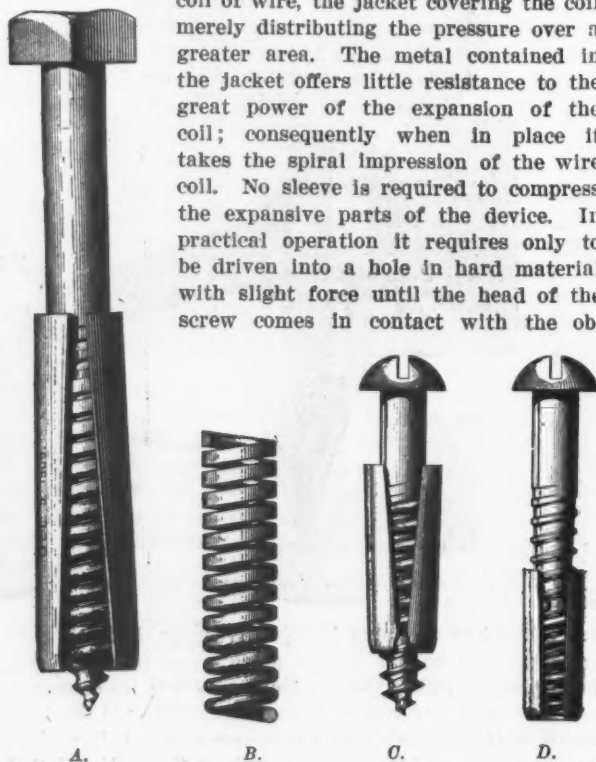


*The Standard Rubbish Burner.*

of galvanized wire with iron supports that have been dipped in asphaltum. It is made in sizes 14 x 20 in. and 15 x 28 in., and is designed for the disposal of waste papers and all kinds of rubbish which accumulates about the home, store or office. The company states that the burner is highly commended by life and fire insurance companies.

### Farrington Expansion Bolts.

H. Farrington, 45 Broadway, New York, is putting on the market the expansion bolts, several forms of which are shown in the accompanying illustrations. They depend for their expansive qualities upon the flexibility of a coil of wire engaging the thread of a common wood screw, or for larger and heavier work on the taper of the mandrel of a screw bolt especially threaded. They are practically made up of two parts: The screw and the coil of wire, the jacket covering the coil merely distributing the pressure over a greater area. The metal contained in the jacket offers little resistance to the great power of the expansion of the coil; consequently when in place it takes the spiral impression of the wire coil. No sleeve is required to compress the expansive parts of the device. In practical operation it requires only to be driven into a hole in hard material with slight force until the head of the screw comes in contact with the ob-



*Farrington Expansion Bolts.—A, Jacket and Coil Expanded by Lag Screw; B, Coil of Wire; C, Jacket Expanded by Taper of Wood Screw at Shank; D, Jacket Expanded by Taper of Screw at Point; E, Concrete Expansion Anchor.*

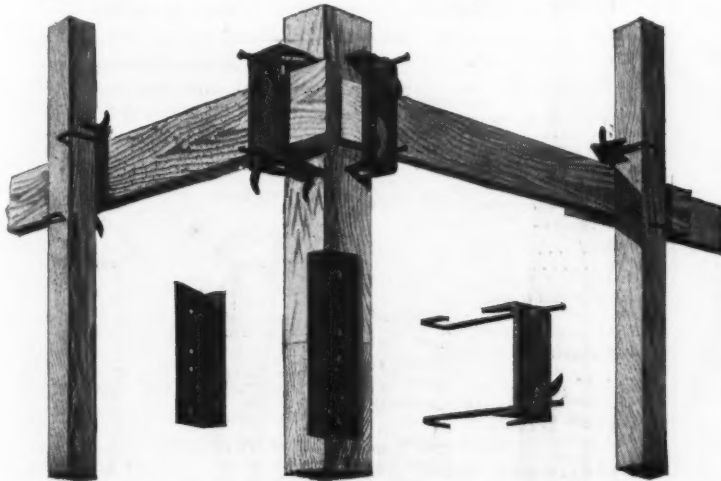
ject to be held; then a few turns of the screw will permanently and efficiently hold the fixture in place. The pressure is equally distributed on all sides of the hole in which it is inserted, and owing to the hardness of the wire there is no tearing or stripping effect, as in devices using soft material. Thus it is claimed that the anchors are not loosened by vibration, and can be removed and replaced as often as a common bolt with nut, without impairing the holding power. A shows a jacket and coil expanded by a lag screw, the coil itself appearing in B. C shows a jacket with coil expanded by the taper of a wood screw at the shank, and D shows same expanded by the taper of the screw at the point. The concrete expansion anchor E is said to afford a secure fastening for embedding in green concrete or grouting in old concrete. The coil of wire inside the anchor is internally tapered, and therefore is expanded by screwing the lag screw into the anchor.

### Non-Explosive White Metal Polish.

C. M. Kimball, Winthrop, Mass., manufacturer of metal polish, is bringing out a new polish known as Kimball's Non-Explosive White Metal Polish for polishing metals and glass. This polish, it is claimed, contains no naphtha, thus insuring against explosions or fire.

### Mason's Ledger Clamp and Pole Splice.

A clamp for fastening the ledger board to the scaffold pole without the use of nails has been brought out by the New England Patent Stage Company, 45 Banks street, West Somerville, Mass., and is illustrated herewith. It is designed for the use of masons, carpenters and building contractors. By the use of the device there is a great saving in lumber when taking down the staging, as the boards are not split or broken as when nailed, and the ledgers will last a long time because they have not been injured by nail holes. The clamp is made of a 9-16-in. steel plate, and will take a board 6, 7 and 8 in. wide. It is the intention to make the clamp also for use in connection with a board 1 1/4 in. thick. The pole splice, also



Mason's Ledger Clamp and Pole Splice.

shown in the illustration, is 15 in. long and made of 3-16 x 4 in. steel. It is put on with 5-16 lag screws. The company recommends that the builder use 3 x 4 in. poles standing 4 in. way out and 1 x 7 in. ledger boards. It is suggested that to put on the ledger clamp quickly the ledgers be tacked on the entire length of the building and then the carpenter may go along putting on the clamps. It will be seen from the illustration that the clamp will fasten either one or two ledgers, according to requirements. The point is made that the clamp is cheaper to use inside a building than horses when going higher than on staging, besides taking up much less room. It is impossible to loosen any part of the clamp as it is

only necessary to burr up the thread on the end of the bolt so the handle cannot come off.

### West's Sanitary Fruit Gatherer.

Montpellier Cup & Metal Works, Montpellier, Ind., is offering the fruit gatherer herewith illustrated. This shows the fruit as it is released by opening a trap at the bottom of the gatherer, falling into the box ready for shipment. The gatherer is made of very heavy tin, well soldered, and will be manufactured in any size desired, so as to suit the requirements of the fruit grower in the



West's Sanitary Fruit Gatherer.

different parts of the country. The device is said to combine three desirable features: first, that of being able to collect more fruit in a given time than by hand picking; second, to pick fruit without touching it with the fingers, thus avoiding bruising it and leaving it in a sanitary condition for the market; and, third, to place upon the market a gatherer that would be within the reach of all from the point of view of price. It is remarked that the fruit grower using this gatherer can rest assured of marketing his produce at the highest prices, also that the stem is not pulled from the limb proper and does not affect the bud of future crops.

## PAINTS, OILS AND COLORS

### Animal, Fish and Vegetable Oils—per gal.

Linseed, State and Western, raw	42 @ 44
City, Boiled	45 @ 46
City, Raw	44 @ 45
Raw, Calcutta, in bbls.	70 @
Lard, Prime, Winter	65 @ 66
Extra No. 1	54 @ 56
No. 1	47 @ 52
Cotton-seed, Crude, f.o.b. mill	@
Summer Yellow, prime	47 1/2 @ 48
Summer White	49 @ 50
Yellow Winter	49 @ 49 1/2
Tallow, Acidless	52 @ 55
Menhaden, Brown, Strained	39 @
Light Strained	39 @
Bleached Winter	41 @
Ex. Bleached Winter	43 @
Cocoonut, Ceylon	6 1/2 @ 6 3/4
Cochin	7 @ 7 1/4
Cod, Domestic, Prime	42 @ 44
Newfoundland	44 @ 46
Red, Elaine	37 @ 39
Saponified	5 1/2 @ 5 3/4
Olive, Yellow	63 @ 67
Neatfoot, Prime	55 @ 58
Palm, Lagos	5 1/2 @ 5 3/4

### Mineral Oils—per gal.

Black, 29 gravity, 25 @ 30 cold test	13 @ 13 1/2
29 gravity, 15 cold test	13 1/2 @ 14
Summer	12 1/2 @ 13
Cylinder, light filtered	20 @ 21
Dark, filtered	13 @ 19
Paraffine, 903-907 sp. gravity	14 1/2 @ 15
903 sp. gravity	13 1/2 @ 14
883 sp. gravity	11 @ 11 1/2
Red	13 1/2 @ 14

### Miscellaneous—

Barites:	
White, Foreign	per ton \$18.50 @ 20.50
Amer., floated	per ton 18.00 @ 20.00
Off color	per ton 13.00 @ 16.50

Chalk, in bulk	per ton 3.00 @ 3.40
China Clay, Imported	per ton 11.50 @ 18.00
Cobalt, Oxide	per 100 lb. 1.45 @ 2.60
Whiting, Commercial	per 100 lb. .42 @ .52
Gilders	per 100 lb. .55 @ .60
Ex. Gilders	per 100 lb. .60 @ .65

Putty, Commercial—per 100 lb.	
In bladders	\$1.70 @ 1.80
In bbls. or tubs	1.20 @ 1.45
In 1 lb to 5 lb cans	2.65 @ 2.95
In 12 1/2 to 50 lb cans	1.50 @ 1.90

Spirits Turpentine—per gal.	
In Oil bbls.	43 1/2 @ 44
In machine bbls.	44 @ 45

Glue—per lb.	
Cabinet	12 @ 15
Common Bone	7 1/2 @ 9
Extra White	18 @ 24
Fish, Liquid, 50 gal. bbls., per gal.	20 @ 22
Foot Stock, White	12 @ 14
Foot Stock, Brown	9 @ 11
German Common Hide	10 @ 12
German Hide	12 @ 18
French	10 @ 40
Irish	13 @ 16
Low Grade	10 @ 12
Medium White	11 @ 17

Gum Shellac—per lb.	
Bleached, Commercial	23 @ 24
Bone Dry	28 @ 29
Button	@
Diamond 1	47 @ 48
Fine, Orange	30 @ 32
A. C. Garnet	25 @ 28
G. A. L.	18 @ 19
Kala Button	17 @ 18
D. C.	48 @ 49
Octagon B.	28 @ 40
T. N.	26 @ 27
V. S. O.	47 @ 48

### Colors in Oil—per lb.

Black, Lampblack	13 @ 14
Blue, Chinese	36 @ 46
Blue, Prussian	32 @ 36
Blue, Ultramarine	13 @ 16
Brown, Vandyke	11 @ 14
Green, Chrome	12 @ 16
Sienna, Raw	12 @ 24
Sienna, Burnt	12 @ 15
Umber, Raw	11 @ 14
Umber, Burnt	11 @ 14

### White Lead, Zinc, &c.—per lb.

Lead, English white, in Oil, 10% @ 10%	
Lead, American White:	
Lots of 500 lb or over, in Oil..	@ 6%
Lots less than 500 lb., in Oil..	@ 7%
Lead, White, in oil, 25 lb tin	@ 7%
pails	@ 7%
Lead, White, in oil, 1 to 5 lb	@ 7%
pails	@ 7%
Lead, American, Terms: On lots of 500 lbs and over 2% for cash if paid in 15 days from date of invoice.	@ 8%

### Zinc, Dry—per lb.

American, dry	5 1/4 @ 5 3/4
Red Seal (French process)	6 1/4 @ 7
Green Seal (French process)	7 1/4 @ 7 1/2
German Red Seal (French process)	6 1/4 @ 6 1/2
Green Seal	7 1/4 @ 7 1/2
White Seal	7 1/4 @ 8 1/4
French, Red Seal	8 1/4 @ 8 1/2
Green Seal	10 1/2 @ 10 3/4

### Dry Colors—per lb.

Black, Carbon	6 1/4 @ 10
Black Drop, American	3 1/4 @ 8
Black Drop, English	5 @ 15
Black, Ivory	16 @ 20
Lamp, commercial	4 @ 6

Blue, Celestial	4 @ 6
Blue, Chinese	31 @ 33
Blue, Prussian	29 @ 31
Blue, Ultramarine	3 1/2 @ 15
Brown, Spanish	1 1/2 @ 1
Carmine, No. 40	\$3.10 @ 3.25
Green, Chrome, ordinary	3 1/2 @ 5
Green, Chrome, pure	17 @ 25
Lead, Red, bbls., 1/2 bbls., kegs.	@ 6%
Litharge, bbls., 1/2 bbls., kegs.	@ 6%
Ocher, American	per ton \$8.50 @ 16.00
American Golden	2 1/2 @ 3 1/4
French	1 1/2 @ 2
Foreign Golden	3 @ 4
Orange Mineral, English	10 @ 12
French	12 1/2 @ 13
German	12 @ 13
American	8 1/2 @ 8 3/4
Red, Indian, English	4 1/2 @ 6
American	3 @ 3 1/4
Red, Turkey, English	4 @ 10
Red, Tuscan, English	7 @ 10
Red, Venetian, Amer.	per 100 lb. \$0.50 @ 1.25
English	per 100 lb. \$1.15 @ 1.60
Sienna, Italian, Burnt and Powdered	3 @ 9
Italian, Raw, Powdered	3 @ 7
American, Raw	1 1/2 @ 2
American Burnt and Powdered	1 1/2 @ 2
Talc, French	per ton \$18.00 @ 25.00
American	per ton 15.00 @ 25.00
Terra Alba, French	per 100 lb. 90 @ 1.00
English	per 100 lb. 80 @ 1.00
American	per 100 lb. 75 @ 1.00
American	per 100 lb. No. 2. 60 @ 65
Umber, Tkey, Bnt. & Pow.	2 1/2 @ 3
Turkey, Raw and Powdered	2 1/2 @ 3
Burnt, American	1 1/2 @ 2
Raw, American	1 1/2 @ 2
Yellow, Chrome, Pure	13 1/2 @ 15
Vermilion, American Lead	7 @ 25
Quicksilver, bulk	65 @
Quicksilver, bags	66 @
English, Imported	65 @ 70
Chinese	30.90 @ 1.00



# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Columbian and Domestic.....33%  
North's.....10%  
Zimmerman's See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Taplin's Perfection.....35%

## Ammunition—See Caps, Car-

tridges, Shells, &c.

## Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-  
Rattlers, 1/2 doz. pairs, Nos. 1,  
\$0.75; 2, \$0.80; 4, \$1.00; 5, \$0.50.  
Fernald Quick Shifter, 1/2 doz.  
pairs.....\$2.00@33.00

## Anvils—American—

Eagle Anvils.....10%  
Hay-Budden, Wrought.....10%  
Trenton.....10%

## Imported—

Swedish Solid Steel Sisco, Superior,  
1/2 lb.....10%  
Peter Wright & Sons, 1/2 lb, 84 to 348  
lb, 11¢; 350 to 600 lb, 11%¢.

## Anvil, Vice and Drill—

Millers Falls Co., \$18.00.....15%10%

## Apple Parers—See Parers,

Apple, &c.

## Aprons, Blacksmiths'—

Livingston Nail Co.....10%

## Augers and Bits—

Com. Double Spur.....75¢10@80%  
Jennings' Patn., Bright.....65¢10@70%  
Black Lip or Blued.....65¢10@65%  
Boring Mach. Augers.....70%  
Car Bits, 12-in. twist.....40¢10%  
Ford's Auger and Car Bits.....40¢10%  
Ft. Washington Auger Co., Com-  
ard's.....35%  
Forstner Pat. Auger Bits.....35%  
C. E. Jennings & Co.,  
No. 10 ext. lip, R. Jennings' list,  
25¢7%  
No. 30, R. Jennings' list.....50%  
Russell Jennings' list.....25¢10@2%  
L'Hommedieu Car Bits.....15%  
Mayhew's Countersink Bits.....45%  
Pugh's Black.....20%  
Pugh's Jennings' Pattern.....35%  
Snell's Auger Bits.....60%  
Snell's Bell Hangers' Bits.....60%  
Snell's Car Bits, 12-in. twist.....60%  
Snell's King Auger Bits.....60%  
Wright's Jennings' Bits.....50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's Pattern, No. 1, 1/2 doz., 32¢;  
No. 2, 1/2 doz., 38¢.....60¢10%  
Ford's, Clark's Pattern.....65¢10%  
C. E. Jennings & Co. Steer's Pat. 25%  
Lavigne Pat., small size, \$18.00; large  
size, \$26.00.....60¢10%  
Swan's.....60%

## Gimlet Bits—

Common Dbl. Cut.....\$3.00@3.25  
German Pattern, Nos. 1 to 10,  
\$4.75; 11 to 13, \$5.75

## Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00  
Anes.....25¢10%  
Universal.....20%

## Ship Augers and Bits—

Ship Augers.....40¢10@—  
Ford's.....35¢10%  
C. E. Jennings & Co.,  
L'Hommedieu's.....6%  
Watrous's.....33¢10@7%  
Snell's.....45%

## Awl Hafts—See Handles,

Mechanics' Tool.

## Awls—

Brad Awls:  
Handled.....gro. \$2.75@3.00  
Unhdded, Shldered.....gro. \$3.65@6%  
Unhdded, Patent.....gro. \$6.60@70%  
Peg Awls:  
Unhdded, Patent.....gro. \$1@34¢  
Unhdded, Shldered.....gro. \$3@70%  
Scratch Awls:  
Handled, Com.....gro. \$3.50@4.00  
Handled, Socket.....gro. \$11.50@12.00

## Awl and Tool Sets—See

Sets, Awl and Tool.

## Axes—

Single Bit, base weights: Per doz.  
First Quality.....\$4.75@5.00  
Second Quality.....\$4.25@4.50  
Double Bit, base weights:  
First Quality.....\$7.00@7.50  
Second Quality.....\$6.50@6.75

## Axle Grease—

See Grease, Axle.

## Axles—

Iron or Steel.

Concord, Loose Collar.....4%10%  
Concord, Solid Collar.....4%10%  
No. 1 Common, Loose.....3%10%  
No. 1 1/2 Com. New Style.....4%10%  
No. 2 Solid Collar.....4%10%  
Half Patent.....10%10%

Nos. 7, 8, 11 and 12.....65¢10%  
Nos. 13 to 14.....65¢10%  
Nos. 15 to 18.....70¢10%  
Nos. 19 to 22.....70¢10%

## Boxes, Axles—

Common and Concord, not

turned.....10%50¢10%

Common and Concord, turned,  
10%60¢10%

Half Patent.....10%9%10%

## Bait— Fishing—

Hendryx:  
A Bait.....20%  
B Bait.....20%  
Competitor Bait.....20%10%

## Balances— Sash—

Caldwell new list.....50¢10%  
Pullman.....50¢10%

## Spring—

Spring Balances.....50¢10@60%  
Chatillon's:  
Light Spg. Balances.....50¢10%  
Straight Balances.....40¢10%  
Circular Balances.....50¢10%  
Large Dial.....50¢10%

## Barb Wire—See Wire, Barb.

## Bars— Crow—

Steel Crowbars, 10 to 40 lb.  
per lb., 2%10@2%10%

## Towel—

No. 10 Ideal, Nickel Plate.....1/2 gro. \$3.80

## Beam, Scale—

Scale Beams.....40%  
Chatillon's No. 1.....30%  
Chatillon's No. 2.....40%

## Beaters, Carpet—

Holt-Lyon Co.,  
No. 12 Wire Coppered 1/2 doz. \$0.80;  
Tinned.....\$0.85  
No. 11 Wire Coppered 1/2 doz. \$1.15;  
Tinned.....\$1.20  
No. 10 Wire Tinned.....1/2 doz. \$1.50

## Beaters Egg—

Dover Stamping & Mfg. Co.,  
Genuine Dover, per gro. No. 1,  
Tumbler Size, \$2.50; No. 2, Fam-  
ily Size, \$7.50; No. 3, Extra Fam-  
ily Size, \$24.00; No. 4, Hotel Size,  
\$30.00.

Holt-Lyon Co.,  
Holt, per doz., No. 5, Jap'd, \$0.80;  
No. A, Jap'd, \$1.15; No. B, Jap'd,  
\$1.85; No. 6, Jap'd, \$1.65;  
Lyon, Jap'd, per doz., No. 2,  
\$1.35.

## Taplin Mfg. Co.,

Improved Dover, per gro. No. 60,  
\$4.00; No. 75, \$4.50; No. 100, \$7.00;  
No. 102, Tin'd, \$8.50; No. 150,  
Hotel, \$15.00; No. 182, Hotel  
Tin'd, \$17.00; No. 200, Tumbler,  
\$8.50; No. 302, Tumbler Tin'd,  
\$9.50; No. 300, Mammoth, per  
doz., \$25.00.

## Bellows—

Blacksmith, Standard List:  
Split Leather.....60¢10@65%  
Grain Leather.....60¢10@65%

## Hand—

Inch.....6 7 8 9 10  
Doz.....\$5.00 5.50 6.00 6.50 7.50

## Molders—

Inch.....10 12 14 16  
Doz.....\$7.50 9.00 12.00 15.00

## Bells— Cow—

Ordinary Goods.....75¢10@75¢10%  
High grade.....70¢10@75%  
Jersey.....75¢10%  
Texas Star.....50%

## Door—

Home, R. & E. Mfg. Co.'s.....55¢10%

## Hand—

Polished, Brass.....50¢10@60%  
White Metal.....50¢10@50¢10%  
Nickel Plated.....50¢10%  
Swiss.....50¢10%  
Cone's Globe Hand Bells.....33%10%

## Miscellaneous—

Farm Bells.....10%2%10%  
Church and School.....60¢10@60%10%

## Belting— Leather—

Standard.....70¢10@70¢10%  
Light.....75¢10%  
Cut Leather Lacing.....50¢10%  
Leather Lacing Sides, per sq. ft.  
22¢10@23¢

## Rubber—

Competition (Low Grade),  
70¢10@75¢10%  
Standard.....60¢10@60%10%  
Best Grades.....33%10@40%10%

## Bench Stops—

See Stops, Bench

## Benders and Upsetters,

Tire—

Green River Tire Benders and Up-  
setters.....20%

## Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:  
Chain, Parts, Spokes.....50%  
Tubes.....60%

## Bits—

Auger, Gimlet, Bit Stock Drills,  
&c.—See Augers and Bits.

## Blocks Tackle—

Common Wooden.....75¢10@75%  
B. & L. B. Co.,  
Boston Wood Snatch, 50%; Eclipse  
Steel, 75%; Hollow Steel, 50¢10%  
Star Wire Rope, 50%; Tarbox  
Metal Snatch, 50%; Tarbox New  
Style Steel, 50¢10%; Wire Rope  
Snatch, 50%  
Lane's Patent Automatic Lock and  
Junior.....30%  
See also Machines, Hoisting.

## Boards, Stove—

Paper and Wood Lined.....55%  
Embossed.....55%

## Boards, Wash—

See Washboards.

## Bobs, Plumb—

Keuffel & Esser Co.....33%10%

## Bolts

Carriage, Machine, &c.—  
Common Carriage (cut thread):  
1/2 & 6 and smaller.....75¢10@—  
Larger and longer.....70¢10%  
Phila. Eagle, \$3.00 list.....80¢10%  
Bolt Ends.....70¢10%  
Machine (Cut Thread):  
1/2 & 4 and smaller.....75¢10@—  
Larger and longer.....70¢10%

## Door and Shutter—

Cast Iron Barrel, Japanned,  
Round Brass Knobs:  
Inch.....3 4 5 6 8  
Per doz. \$0.30 .35 .45 .60 .80  
Cast Iron Spring Foot, Jap'd:  
Inch.....6 8 10  
Per doz.....\$1.20 1.50 2.25  
Cast Iron Chain, Flat, Japanned:  
Inch.....6 8 10  
Per doz.....\$1.00 1.40 1.65  
Cast Iron Flat Shutter, Jap'd,  
Brass Knobs:  
Inch.....6 8 10  
Per doz.....\$0.75 .95 1.25  
Wrought Barrel Jap'd, 80¢10@80¢10%  
Barrel Bronzed.....60¢10%  
Spring.....70¢10@70¢10%  
Shutter.....50¢10@50¢10%  
Square Neck.....75¢10@75%  
Square.....70¢10@70%  
Ives' Patent Door.....55%  
Ives' Wrought Metal.....45%

## Expansion—

F. H. Evans' Crescent.....40¢10%  
Richards Mfg. Co.....55¢10%  
Steward & Romain Mfg. Co.,  
Style No. 13, Double.....60%  
Style No. 1, Single.....60%  
Style No. 100, Dbl. Jaw, Single.....55%  
Lag Screw.....60%

## Plow and Stove—

Plow.....65¢10@70%  
Stove.....85¢10@85%10%

## Tire—

Common Iron.....80%  
Norway Iron.....80%  
American Screw Co.,  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82%  
Bay State, list Dec. 23, '89.....80%  
Franklin Moore Co.,  
Norway Phila., list Oct. 16, '84.....80%  
Eagle Phila., list Oct. 16, '84.....82%  
Eclipse, list Dec. 23, '89.....80%  
Russell, Burdall & Ward Bolt &  
Nut Co.,  
Empire, list Dec. 23, '89.....80%  
Norway Phila., list Oct. '84.....82%  
Eagle.....82%  
Shelton Co.,  
Tiger Brand, list Dec. 23, '89.....80%  
Phila., Eagle, list Oct. 16, 1884.....82%  
Upon Not Co.,  
Tire Bolts.....72%10%

## Borers, Bung—

Borers Bung, Ring, with Handle:  
Inch.....1 1/2 2 1/2 3 1/2 4 1/2  
Per doz.....\$4.80 5.60 6.40 8.00  
Inch.....2 1/2 3 1/2 4 1/2  
Per doz.....\$3.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No.  
2, \$1.75; No. 3, \$2.50 each.....25%

## Boxes, Mitre—

C. E. Jennings & Co.....25%  
Langdon, New Langdon and Lang-  
don Improved, 20¢10%; Langdon  
Acme.....15¢10%  
Perfection.....40%  
Seavey.....45%

## Braces—

Common Ball, American.....\$1.50  
Barber's.....50¢10@60¢10%  
Fray's Genuine Spoford's.....60%  
Fray's No. 61, 106, 206, 614.....50%  
C. E. Jennings & Co.....50%  
Mayhew's Hatchet.....60%  
Mayhew's Quick Action Hay Pat.....50%  
Millers Falls Drill Braces.....25¢10%  
P. S. & W. Co., Peck's Pat.....60¢10%

## Brackets—

Wrought Steel.....70¢10@75¢10%  
Bradley Metal Clasp, 80¢10@80¢10%  
Griffin's Pressed Steel.....75¢10@75%  
Griffin's Folding Brackets.....70¢10%  
Taplin Victor Handy Egg Beater  
Bracket.....1/2 doz. \$1.50

## Bright Wire Goods—

See Wire and Wire Goods.

## Broilers—

Kilbourne Mfg. Co.....75¢20%  
Wire Goods Co.....75%

## Buckets, Galvanized—

Mfr's list, price per gross.  
Quart.....10 12 14  
Water, Reg.....26.85 29.50 33.50  
Water, Hwy.....45.35 48.00 52.00  
Fire, Rd. Btm. 32.00 34.65 38.65  
Well.....37.35 41.35 45.35

## Bull Rings—See Rings, Bull.

## Butts— Brass—

Wrought, High List, Oct. 26, '06.....55%  
Cast Brass, Tiebout's.....40%

## Cast Iron—

Fast Joint, Broad.....40¢10@50%  
Fast Joint, Narrow.....40¢10@50%  
Loose Joint.....70¢10@75%  
Loose Pin.....70¢10@75%  
Mayer's Hinges.....70¢10@75%  
Parliament Butts.....70¢10@75%

## Wrought Steel—

Bright.  
Light Narrow, Light Re-  
versible.....70¢10%  
Reversible and Broad.....70¢10%  
Loose Joint, Narrow, Light  
Inside Blind, &c.....70%  
Back Flaps, Table Chest.....65%  
Japanned.  
Light Narrow, Loose Pin.....40%  
Broad.....40%  
Steeple Tipped.....70%  
Ball Tipped.....70%

Extra, 10¢

**Cages, Bird—**

Hendryx Brass: Series 3000, 5000,  
1100, net list; 1200, 15%; 200, 300,  
900 ..... 30%  
Hendryx Bronze: Series 700, 800, 30%  
Hendryx Enamelled ..... 35%

**Calipers—See Compasses.****Calks, Toe and Heel—**

Blunt, 1 prong, per lb., 4 1/4 @ 4 1/2¢  
Sharp, 1 prong, per lb., 4 1/4 @ 4 1/2¢  
Burke's, Blunt, 4 @ 4 1/2¢; Sharp, 4 @ 4 1/2¢  
Lautier, Blunt, 4 @ 4 1/2¢; Sharp, 4 @ 4 1/2¢  
Perkins, Blunt, 1 lb., 3 @ 6¢; Sharp, 4 1/2¢

**Can Openers—**

See Openers, Can.

**Caps, Percussion—**

Eley's E. B. .... 52 @ 55¢  
G. D. .... per M 34 @ 35¢  
F. L. .... per M 40 @ 42¢  
G. E. .... per M 48 @ 50¢  
Musket .... per M 62 @ 63¢

**Primers—**

Berdan Primers, \$2 per M. 20¢5¢  
Primer Shells and Bullets. 15¢10¢  
All other primers per M. \$1.52 @ 1.60

**Carpet Stretchers—**

See Stretchers, Carpet.

**Cartridges—**

Blank Cartridges:  
32 C. F., \$5.50 ..... 10¢5¢  
38 C. F., \$7.00 ..... 10¢5¢  
22 cal. Rim, \$1.50 ..... 10¢5¢  
32 cal. Rim, \$2.75 ..... 10¢5¢  
B. B. Caps, Con. Ball, Swgd. \$1.80  
B. B. Caps, Round Ball. .... \$1.19  
Central Fire. .... 25¢  
Target and Sporting Rifle. 15¢5¢  
Primer Shells and Bullets. 15¢10¢  
Rim Fire, Sporting. .... 50¢  
Rim Fire, Military. .... 15¢5¢

**Casters—**

Bcd ..... 65¢10¢  
Plate ..... 60¢5¢  
Philadelphia ..... 70¢10¢  
Acme, Ball Bearing ..... 35¢  
Gem (Roller Bearing) ..... 70¢10¢10¢5¢  
Steel Gem ..... 50¢  
Standard Ball Bearing ..... 45¢  
Yale (Double Wheel) low list. 40¢10¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Proof Coil—**

American Coil, Straight Link:  
3-16 3/4 5-16 3/4 7-16 3/4 5¢  
8-15 5-35 4-60 3-95 3-75 3-65 3-55  
3/4 7-1 1 1/4 to 1 1/2 inch.  
\$3.35 3.55

In case lots, deduct 25¢.

German Coil. .... 60 @ 60¢5¢  
German Pattern Coil:  
6-0 to 1 ..... 70¢5¢70¢10¢  
2 and 3 ..... 60¢10¢10¢60¢10¢5¢  
4, 5 and 6 ..... 50¢10¢50¢10¢5¢

**Halter—**

Halter Chains. .... 60 @ 60¢5¢  
German Pattern Halter Chains,  
list July 21, '97. .... 60 @ 10¢5¢  
Covert Mfg. Co.:  
Halter ..... 35¢5¢

**Cow Ties—**

See Halters and Ties.

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pr.  
6 1/4-6-3, Straight, with ring. \$25.00  
6 1/4-6-2, Straight, with ring. \$29.00  
6 1/4-8-2, Straight, with ring. \$32.00  
6 1/4-10-2, Str'ght, with ring. \$37.00

NOTE.—Add 2¢ per pair for Hooks  
Twist Traces: add per pair for Nos. 3  
and 3, 2¢; No. 1, 3¢; No. 0, 4¢ to price of  
Straight Link.

Eastern Standard Traces, Wag-  
on Chain, &c. .... 60 @ 10¢60¢10¢5¢

**Miscellaneous—**

Jack Chain, list July 10, '93:  
Iron ..... 60 @ 10¢7 1/2¢  
Brass ..... 65¢  
Safety and Plumbers' Chain. 75¢  
Gal. Pump Chain. .... lb., 4 1/2 @ 5¢  
Bridgeport Chain Co.:  
Triumph Halter and Coll. 35¢2 1/2 @ 40¢  
Triumph Dog ..... 50¢10¢60¢  
Brown Halter and Coll. .... 45 @ 60¢5¢  
Covert Mfg. Co.:  
Breast, Halter, Heel, Rein, Stal-  
lion ..... 40¢  
Oneida Community:  
American Halter, Dog and Kennel  
Chains ..... 35¢2 1/2 @ 40¢  
Niagara Dog Leads and Kennel  
Chains ..... 45 @ 50¢5¢  
Wire Goods Co.:  
Dog Chain ..... 70¢  
Universal Dbl.-Jointed Chain. 50¢

**Chain and Ribbon, Sash—**

Oneida Community:  
Steel Chain. .... 60¢  
Pullman:  
Bronze Chain, 60%; Steel Chain,  
Coppered ..... 60¢10¢  
Sash Chain Attachments, per set. 8¢  
Aluminum Sash Ribbon, per 100  
ft. .... \$2.00 @ 35.00  
Sash Ribbon Attachments, per set. 8¢

**Chalk—(From Jobbers.)**

Carpenters' Blue. .... gro., 50 @ 55¢  
Carpenters' Red. .... gro., 45 @ 50¢  
Carpenters' White. .... gro., 40 @ 45¢

**Checks, Door—**

Hardley's ..... 45¢  
Pullman, per doz. .... \$4.00  
Russwin ..... 35¢4¢

**Chests, Tool—**

American Tool Chest Co.:  
Boys' Chests, with Tools. .... 50¢  
Youths' Chests, with Tools. .... 35¢  
Gentlemen's Chests, with Tools. 25¢  
Farmers', Carpenters, etc., Chests  
with Tools ..... 20¢  
Machinists' and Pipe Fitters'  
Chests, Empty. .... 45¢  
Tool Cabinets ..... 45¢  
C. E. Jennings & Co.'s Machinists'  
Tool Chests ..... 75¢

**Chisels—**

Socket Framing and Firmer  
Standard List. .... 80 @ 10¢—  
Buck Bros. .... 30¢  
C. E. Jennings & Co.:  
Socket Firmer No. 10. .... 25¢7 1/2¢  
Socket Framing No. 15. .... 25¢7 1/2¢  
Swan's ..... 66¢ @ 70¢  
L. & I. J. White & Co. .... 30 @ 30¢5¢

**Tanged—**

Tanged Firmers. .... 30¢5¢35¢  
Buck Bros. .... 30¢  
C. E. Jennings & Co. Nos. 191, 181, 25¢  
L. & I. J. White Co. .... 25¢5¢

**Cold—**

Cold Chisels, good quality. 13¢15¢  
Cold Chisels, fair quality. 11¢12¢  
Cold Chisels, ordinary. .... 9¢10¢

**Chucks—**

Almond Drill Chucks. .... 35¢  
Almond Turret Six-Tool Chuck. 40¢  
Beach Pat, each \$3.00 ..... 35¢5¢  
Empire ..... 25¢  
Blacksmiths' Chucks, New Model, 25¢  
Jacobs' Drill Chucks. .... 35¢  
Pratt's Positive Drive. .... 25¢  
Skinner Patent Chucks:  
Independent Lathe Chucks. .... 35¢  
Universal, Reversible Jaws. .... 35¢  
Combination, Reversible Jaws. 35¢  
Drill Chucks, New Model, 25¢  
Standard, 45¢; Skinner Pat.  
25¢; Positive Drive. .... 40¢  
Planer Chucks. .... 20¢  
Face Plate Jaws. .... 35¢  
Standard Tool Co.:  
Improved Drill Chuck. .... 45¢  
Union Mfg. Co.:  
Combination, Nos. 1, 2, 3, 4, 5, 6,  
7, 8 and 17, 40¢; No. 21. .... 35¢  
Scroll Combinations, Nos. 53 and  
84 ..... 30¢  
Geared Scroll, Nos. 33, 34 and 35. 25¢  
Independent Iron, Nos. 18 and 318. 35¢  
Independent Steel, No. 54. .... 25¢  
Union Drill, Nos. 000, 09, 100, 101,  
102, 103, 104. .... 35¢  
Union Czar Drill. .... 25¢  
Universal, 11, 12, 16, 17, 13, 14, 15, 40¢  
Universal No. 42. .... 35¢  
Iron Face Plate Jaws, Nos. 28, 30,  
48 and 50. .... 35¢  
Steel Face Plate Jaws, Nos. 70 and  
72 ..... 30¢  
Westcott Patent Chucks:  
Lathe Chucks. .... 50¢  
Little Giant Auxiliary Drill. .... 50¢  
Little Giant Double Grip Drill. 50¢  
Little Giant Drill, Improved. .... 50¢  
Oneida Drill. .... 50¢  
Scroll Combination Lathe. .... 50¢  
Whitaker Mfg. Co.:  
National Drill. .... 25¢

**Clamps—**

Adjustable Hammers. .... 20 @ 20¢5¢  
Carriage Makers', P. S. & W.  
Co. .... 50¢10¢  
Bealy, Parallel, No. 21. .... 30¢10¢  
Myers' Hay Rack ..... 45¢  
Lineman's Swedish Neverturn. 65¢  
Wood Workers' Hammers. .... 40¢10¢  
Saw Clamps, see Vises, Saw Filers.

**Cleaners, Drain,**

Iwan's Champion, Adjustable. .... 50¢  
Iwan's Champion, Stationary. .... 40¢

**Sidewalk—**

Star Socket, All Steel. 10 doz. \$4.05 net  
Star Shank, All Steel. 10 doz. \$3.24 net  
W. & C. Shank, All Steel, 10 doz.,  
7 1/2 in., \$3.00; 8 in., \$3.25.

**Cleavers, Butchers'—**

Foster Bros. .... 30¢  
Fayette B., Plumb. .... 35¢  
L. & I. J. White Co. .... 30¢

**Clippers, Horse and**

Chicago Flexible Shaft Co.:  
1902 Chicago Horse, each. \$10.75  
20 1/2 Century Horse, each. \$5.00  
Lightning Belt Horse, each. \$15.00  
Chicago Belt Horse, each. \$20.00  
Stewart's Enclosed Gear  
Horse, each. .... \$6.75  
Stewart's Patent Sheep Shear-  
ing Machine, each. .... \$12.75  
Stewart Enclosed Gear Shear-  
ing Machine, No. 8, each. \$9.75

**Clips, Axle—**

Regular Styles, list July 1, '05,  
80¢80¢10¢

**Cloth and Netting, wire**

—See Wire, &c.

**Cocks, Brass—**

Hardware list:  
Plain Bibbs, Globe, Kerogene,  
Racking, Liquor, Bottling,  
&c. .... 75¢  
Compression Bibbs. .... 70¢

**Coffee Mills—**

See Mills, Coffee.

**Collars, Dog—**

Nickel Chain, Walter B. Stevens &  
Son's list. .... 40¢  
Leather, Walter B. Stevens & Son's  
list ..... 40¢

**Compasses, Dividers, &c.**

Ordinary Goods. .... 70¢10¢75¢

**Conductor Pipe—**

L. C. L. to Dealers:  
Gal. Steel. Charcoal.  
Northeastern. 70¢10¢ 50¢10¢7 1/2¢  
Eastern. .... 75¢ 50¢10¢7 1/2¢  
Pittsburgh. 75¢10¢5¢ 60¢  
Central. .... 75¢10¢ 60¢  
Northwestern. .... 75¢7 1/2¢ 60¢  
Western. .... 70¢12 1/2¢ 50¢12 1/2¢  
Tennessee. .... 70¢10¢ 50¢12 1/2¢  
Southern. .... 70¢ 50¢12 1/2¢  
Southeastern. 70¢ 50¢6¢

Terms, 60 days: 2% cash 10 days. Fac-  
tory shipments generally delivered.  
See also Eave Troughs.

**Coolers, Water—**

L. & G. Mfg. Co.:  
Gal. .... 2 3 4 6 8  
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90  
Galvanized, Lined, side handles,  
Gal. .... 2 3 4 6 8  
Each ..... \$1.95 \$2.15 \$2.40 \$3.30 \$4.15  
White Enamelled ..... 10¢  
Agate Lined ..... 10¢

**Coppers' Tools—**

See Tools, Coopers'.

**Coppers, Soldering—**

Soldering Coppers, 3 lb. to pair  
and heavier, 22¢25¢; lighter  
than 3 lb. to pair. .... 24¢27¢

**Cord— Sash—**

Braided, Drab. .... lb. 35¢  
Braided, White, Com., Nos. 8  
to 12, 20¢; No. 7, 20 1/2¢; No. 6,  
21 1/2¢. In lots of 12 doz. or  
over, 1 cent less per pound.

Cable Laid Italian, lb., No. 18, 37¢  
Italian, lb., No. 18, 25¢; B, 22¢  
Common India. .... lb., 11¢11 1/2¢  
Cotton Sash Cord, Twisted, 18¢20¢  
Patent Russia. .... lb. .... 20¢  
Cable Laid Russia. .... lb. .... 21¢  
India Hemp, Br'd'd. .... lb. .... 21¢  
India Hemp, Twisted. .... lb. 13¢14¢  
Patent India, Twisted. .... lb. 17¢  
Pearl Braided, cotton, No. 6, 10 lb.  
27 1/2¢; No. 7, 28 1/2¢; Nos. 8 to 12, 26¢  
Edystone, Braided, No. 8 to 12,  
26¢; 7, 26 1/2¢; 6, 27 1/2¢.

Harmony Cable Laid Italian, Nos. 7  
to 10. .... lb. 23¢  
Pullman:  
Wire Sash Cord. .... 10¢  
Sash Cord Attachments, per 100. \$2.00  
Samson, Nos. 8 to 12:  
Braided, 3 lb., Drab Cotton,  
50¢; Italian Hemp, 40¢ @  
50¢; Linen, 55¢; White Cot-  
ton, 50¢; Spot Cord. .... 60¢  
Massachusetts, White. .... lb. 45¢  
Massachusetts, Drab. .... lb. 45¢  
Phoenix, White, Nos. 8 to 12. .... 27¢  
Silver Lake, per lb.:  
B, Drab, 45¢; A, White, 40¢;  
B, Drab, 40¢; A, White, 35¢;  
Italian Hemp, 40¢; Linen, 57 1/2¢  
See also Chain and Ribbon.

Wire, Picture—  
Full Length. .... 90 @ —  
Short Length. .... 90 @ 20¢ @ —  
Hendryx Standard Wire Picture Cord,  
old list, 85¢10¢  
Turner & Stanton Co. Wire Picture  
Cord ..... 85¢10¢

**Cradles—**

Grain ..... 40¢12 1/2¢

**Craysons—**

White Round Craysons, Cases, 100  
gro., \$6.50 @ \$7.50 at factory, but  
lower prices made by jobbers.

Zelnicke's Lumber:  
White and Purple, Indelible. \$7.50  
Blue, Red, Green, Yellow and  
Terra Cotta, \$6.50; Black. \$4.50  
Giant Lumber, 5 1/4 in. x 15-16 in.  
round, all colors, \$12.00; Indel-  
ible, \$14.00; Black. .... \$10.00  
Genuine Soapstone, Metal Workers',  
5 in. x 1/4 in. Round, \$2.50; 5 in. x  
1/4 in. Square, \$1.75; 5 x 1/2 x 3-16,  
\$2.50; 5 x 1 1/4 x 3-16. .... \$3.00  
Suremark, Black, \$2.25; Blue, Red  
and Yellow. .... \$2.50

**Crooks, Shepherds'—**

Fort Madison, per doz., Heavy, \$5.50;  
Light ..... \$5.00

**Crow Bars—See Bars, Crow.****Cultivators—**

Victor Garden. .... 50¢

**Cutlery, Table—**

International Silver Company:  
No. 12 M'd'm Knives, 1947. 10 doz. \$3.50  
Star, Eagle, Rogers & Hamilton  
and Anchor. .... 10 doz. \$3.00  
Wm. Rogers & Son. .... 10 doz. \$2.50

**Cutters— Glass—**

H. H. Mayhew Co. .... 40¢  
Red Devil. .... 60¢  
B. Mfg. Co. .... 40¢  
Woodward ..... 50¢

**Meat and Food—**

American ..... 30¢  
Nos. .... 401 402 403 404 405 406 407  
Each ..... \$5 \$7 \$10 \$12 \$25 \$50 \$60  
Enterprise:  
Nos. .... 5 10 12 22 32  
Each ..... \$2 \$3 \$2.75 \$4.50 \$6 25 @ 25¢7 1/2¢  
No. 202, \$1.50. .... 40¢7 1/2¢  
P. S. & W. Co.:  
Dixon's ..... 10 doz. 33 1/2¢  
Nos. .... 1 2 3 4 5 6 7 8 9 10  
Ideal ..... \$1.00 \$1.70 \$1.90 \$3.00  
Hales ..... 40 @ 40¢5¢  
Little Giant. .... 60 @ 10¢5¢  
Nos. .... 305 310 312 325 322  
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00  
New Triumph No. 005, 10 doz. \$24.00.  
40¢10¢  
Russwin Food, No. 1, \$24.00; No. 2,  
\$27.00. .... 45¢10¢10¢  
Enterprise Beef Shavers. .... 25¢30¢

**Slaw and Kraut—**

Henry Diston & Sons:  
Slaw and Kraut Cutters. .... 35¢  
Corn Graters. .... 30¢  
J. M. Mast Mfg. Co.:  
Slaw Cutters, 1 Knife. .... doz. \$3.00  
Combined Slaw Cutter and Corn  
Grater ..... doz. \$4.00

**Tobacco—**

All Iron, Cheap. .... doz. \$4.25 @ 4.50  
Enterprise ..... 25¢30¢  
National, 10 doz., No. 1, \$21; No. 2,  
\$18 ..... doz. .... 40¢

**Diggers, Post Hole, &c—**

Diston's:  
Rapid, 10 doz., \$24.00 ..... 25¢  
Samson, 10 doz., \$34.00 ..... 25¢  
Iwan's Improved Post Hole Auger, 40¢  
Vaughan Pattern Post Hole Auger,  
10 doz., \$7.00 ..... 30¢  
Perfection Post Hole Diggers, 10  
doz. .... \$2.75  
Split Handle Post Hole Diggers,  
10 doz., \$7.75 ..... 30¢  
Hercules Pattern, 10 doz. .... \$10.00  
Kohler's, 10 doz., Universal, \$15.00;  
Little Giant, \$12.00; Hercules,  
\$10.00; Invincible, \$9.00; Rival,  
\$8.50; Pioneer. .... \$7.50  
Never-Break Post Hole Diggers, 10  
doz., \$24.00 ..... 60¢

**Dividers—See Compasses.****Drawing Knives—**

See Knives, Drawing.

**Dressers Emery Wheel—**

Sterling Emery Wheel Dressers. .... 35¢  
Sterling Wheel Dresser Cutters. .... 35¢

**Drills and Drill Stocks—**

Blacksmith's Common Drilling  
Machines. .... \$1.50 @ 1.75  
Breast, Millers Falls. .... 15¢10¢  
Breast, P. S. & W. .... 33 1/2¢  
Goodell Automatic Drills 50¢10¢60¢10¢  
Millers Falls Automatic Drills. 33 1/2¢10¢  
Ratchet, Curtis & Curtis. .... 25¢  
Ratchet, Parker's. .... 40¢  
Ratchet, Weston's. .... 40¢  
Ratchet, Weston's, Style H Im-  
proved ..... 40¢  
Ratchet, No. 012. .... 40¢  
Ratchet, Celebrated. .... 40¢  
Ratchet, Whitney's, P. S. & W. .... 50¢5¢

**Whitney's Hand Drill, No. 1, \$10.00;**

Adjustable, No. 10, \$12.00. .... 33 1/2¢

**Twist Drills—**

Bit Stock. .... 70 @ 70¢5¢  
Taper and Straight Shank. .... 60 @ 10¢70¢

**Drivers, Screw—**

Screw Driver Bits, per doz. 45¢50¢  
Balsey's Screw Holder and Driver, 10  
doz., 2 1/2-in., \$6; 4-in., \$7.50; 6-in.,  
\$9 ..... 50¢  
Buck Bros' Screw Driver Bits. .... 30¢  
Champion ..... 50¢  
Diston's ..... 70¢  
Frax's Hol. H'dle Sets, No. 3, \$12.50;  
Ford's Brace Screw Drivers. .... 40¢10¢  
Gay's Double Action Ratchet. .... 35¢  
Goodell's Auto. .... 65 @ 65¢10¢  
Mayhew's Black Handle. .... 40¢  
Mayhew's Monarch. .... 40¢  
Millers Falls, Nos. 20 and 21. .... 25¢10¢  
Millers Falls, Nos. 11, 12, 11, 42, 15¢10¢  
Sma & Remenway Co. Never-  
tarn, 65%; Elmore, 30¢10¢

Swan's:  
Nos. 7565 to 7568, 60%; No. 7540,  
40¢10¢

**Eave Trough, Galvanized—**

Territory. Gal. Steel. Charcoal. Iron.  
Northeastern. 75¢10¢5¢ 60¢20¢  
Eastern. .... 80¢1 1/2¢ 60¢20¢  
Pittsburgh. .... 80¢20¢ 65¢10¢  
Central. .... 80¢10¢10¢2 1/2¢ 65¢10¢  
Northwestern. 80¢10¢10¢ 65¢10¢  
Western. .... 80¢10¢ 60¢10¢5¢  
Tennessee. .... 80¢5¢ 60¢10¢5¢  
Southern. .... 80¢ 60¢10¢5¢  
Southeastern. 75¢10¢2 1/2¢ 60¢5¢

Terms.—2% for cash. Factory shipments  
generally delivered.  
Note.—Lower prices are made in some  
sections.

**See also Conductor Pipe and Elbows.****Elbows and Shoes—**

Factory shipments, all territories:  
Galv. Steel and Galv. C. I.  
Standard Gauge. .... 85 @ 85¢10¢  
No. 26. .... 50¢  
No. 24. .... 25¢  
No. 22. .... 10¢

**Elbows, Stove Pipe—**

Edwards, Standard Blue. .... 40¢10¢10¢  
Edwards, Royal Blue. .... 40¢10¢10¢  
Reeves, Dover, one piece. .... 40¢10¢

**Emery, Turkish—**

4 to 5 1/2 to  
16: 220: Flour.  
Kegs ..... lb. 5 ¢ 5 1/2 ¢ 3 1/2 ¢  
1/2 Kegs ..... lb. 5 1/2 ¢ 5 1/2 ¢ 3 1/2 ¢  
1/4 Kegs ..... lb. 5 1/2 ¢ 6 ¢ 4 ¢  
10-lb. cans, .....  
10 in case. .... 6 1/2 ¢ 7 ¢ 6 ¢  
10-lb. cans, less  
than 10. .... 10 ¢ 10 ¢ 8 ¢  
Less quantity. .... 10 ¢ 10 ¢ 8 ¢  
NOTE.—In lots 1 to 3 tons a discount of  
10% is given.

**Extractors, Lemon Juice—**

—See Squeezers, Lemon.





## Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1909, or selling at net prices.

Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50  
Star Double Bit.....\$3.20  
Ft. Madison Cotton Hoe.....70¢@10¢  
Ft. Madison Crescent Cultivator Hoe.....70¢@10¢  
Ft. Madison Mattock Hoes.....70¢@10¢  
Regular Weight.....½ doz. 40¢@5¢  
Junior Size.....½ doz. \$4.00  
Ft. Madison Sprouting Hoe, ½ doz. 60¢@10¢  
Ft. Madison Dixie Tobacco Hoe.....75¢@10¢  
Kretzinger's Cut Easy.....75¢@10¢  
Warren Hoe.....45¢@10¢  
W. & C. Ivanhoe.....75¢@10¢  
B. B. 6 in. Cultivator Hoe.....\$3.40  
B. B. 6 in. in.....\$3.50  
Acme Weeding.....½ doz. net, \$4.35  
W. & C. L'tning Shuffle Hoe, ½ doz. \$5.25

## Hoisting Apparatus—

See Machines, Hoisting.

## Holders—Bit—

Angular, ½ doz. \$24.00.....45¢@10¢

## Door—

Bardley's, Iron, 40%; Brass and Bronze.....25¢  
Empire.....50¢  
Pullman.....25¢  
Richards Mfg. Co., No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50¢  
Superior.....35¢

## File and Tool—

Nicholson File Holders and File Handles.....33¢@40¢

## Fruit Jar—

Triumph Fruit Jar Holder, ½ gross, \$10.80; ½ doz. \$1.25

## Trace and Rein—

Fernald Double Trace Holder, ½ doz. pairs.....\$1.25

## Dash Rein Holder, ½ doz. pairs.....\$1.25

## Hones—Razor—

Pike Mfg. Co., Belgian and Swatv. 50%; German.....33¢@40¢

## Hooks—Cast Iron—

Bird Cage, Reading.....40¢

Clothes Line, Reading List.....40¢

Coat and Hat, Reading.....45¢@20¢

Coat and Hat, Wrightsville.....60¢@5¢

Harness, Reading List.....40¢

## Wire—

Belt.....80¢

Wire C. &amp; H. Hooks.....30¢

Bradley Metal Clasp Wire, Coat and Hat, 70¢@10¢; Ceiling.....70¢@10¢

Columbian Hdw. Co., Gem.....70¢@10¢

Parker Wire Goods Co., King.....70¢@10¢

Wire Goods Co.: Chief, 70%; Crown, 75%; Czar, 65%; V. Brace, 75%; Czar Harness, 50¢@10¢

## Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.50

Cotton.....½ doz. \$1.05@1.25

Wrought Staples, Hooks, &amp;c.—See Wrought Goods.

## Miscellaneous—

Hooks, Bench, See Stops, Bench.

Bush, Light, doz., \$6.20; Medium, \$6.75; Heavy, \$7.65

Grass, best, all sizes, per doz. \$3.00

Grass, common grades, all sizes, per doz. \$1.50

Whitfrees.....1b. 5¢@6¢

Hooks and Eyes:

Brass.....60¢@60¢@10¢

Malleable Iron.....70¢@70¢@10¢

Covert Mfg. Co., Gate and Scuttle Hooks.....40¢

Ft. Madison Cut-Easy Corn Hooks, ½ doz. \$3.25 net

Turner &amp; Stanton Co. Cup and Shoulder.....80¢@10¢

Bench Hooks—See Bench Stops.

Corn Hooks—See Knives, Corn.

## Horse Nails—

See Nails, Horse.

## Horseshoes—

See Shoes, Horses.

## Hose, Rubber—

Garden Hose, ¾-inch:

Competition.....ft. 5¢@6¢

3-ply Guaranteed.....ft. 8¢@9¢

4-ply Guaranteed.....ft. 10¢@11¢

Cotton Garden, ¾-in., coupled:

Low Grade.....ft. 8¢@9¢

Fair Quality.....ft. 10¢@11¢

## Irons—Sad—

From 4 to 10.....1b. 3¢@3½¢

B. B. Sad Irons.....1b. 3½¢@3½¢

Mrs. Potts', cents per set:

Nos. 50 55 60 65

Jap'd Tops.....83 80 93 91

Tin'd Tops.....88 85 98 95

New England Pressing.....1b. 3½¢@4¢

## Bar and Corner—

Richards Mfg. Co., Bar, 60¢@10¢

Corner.....60¢

## Pinking—

Pinking Irons.....doz. 60¢

## Irons, Soldering

See Coppers.

## Jacks, Wagons—

Covert Mfg. Co.: Auto Screw.....30¢@2¢; Steel, 45¢

Lockport.....50¢

Lane's Steel.....30¢@5¢

Richards' Tiger Steel, No. 130.....50¢@10¢

Smith &amp; Hemenway Co.'s.....25¢

## Ladder—

Richards Mfg. Co., Ladder Jacks.....50¢

## Kettles—

Brass, Spun, Plain.....20¢@25¢  
Enamelled and Cast Iron—See Ware, Hollow.

## Knives—

Butcher, Kitchen, &amp;c.—

Foster Bros.' Butcher, &amp;c.....30¢

Wilkinson Shear &amp; Cutlery Co.....60¢

## Corn—

Columbian Cutlery Co., Wilent

Brand Knives and Hooks.....60¢

Withington Acme, ½ doz. \$2.65

Dent, \$2.75; Adj. Serrated, \$2.20

Serrated, \$2.10; Yankee No. 1, \$1.50

Yankee No. 2, \$1.15

## Drawing—

Standard List.....80¢@10¢—

C. E. Jennings &amp; Co., Nos. 45, 46, 25¢@74¢

Jennings &amp; Griffin, Nos. 41, 42, 66¢@74¢

Swan's.....66¢@70¢

Watrous.....16¢

L. &amp; I. J. White.....20¢@25¢

## Hay and Straw—

Serrated Edge, per doz. \$5.50@5.75

Iwan's Sickle Edge.....½ doz. \$9.50

Iwan's Serrated.....½ doz. \$10.00

## Miscellaneous—

Farriers'.....doz. \$2.60@3.55

Wootenholm's.....½ doz. \$3.00@3.25

## Knobs—

Base, 2½-inch, Birch or Maple,

Rubber Tip.....gro. \$1.25@1.40

Carriage, Jap., all sizes, gro. 40¢@45¢

Door, Mineral.....doz. 65¢@70¢

Door, Por. Jap'd.....doz. 70¢@75¢

Door, Por. Nickel.....doz. \$2.05@2.15

Bardley's Wood Door, Shutters, &amp;c. 15¢

## Lacing, Leather—

See Belting, Leather

## Ladders, Store, &amp;c.—

Allith Mfg. Co., Reliable.....50¢

Lane's Store.....25¢

Myers' Noiseless Store Ladders.....50¢

Richards Mfg. Co.: Improved Noiseless, No. 112.....50¢

Climax Shelf, No. 113.....50¢

Trolley, No. 109.....50¢

## Ladles, Melting—

L. &amp; G. Mfg. Co. (low list).....20¢

P. S. &amp; W.....40¢@10¢

## Lanterns—Tubular—

Regular, No. 0.....doz. \$1.35@1.50

Side Lift, No. 0.....doz. \$1.60@1.75

Hinge Globe, No. 0.....doz. \$1.60@1.75

Other Styles.....40¢@10¢

## Bull's Eye Police—

3-inch.....doz. \$1.25@1.50

## Latches—Thumb—

Roggin's Latches, with screw, doz. 35¢@40¢

## Door—

Allith Mfg. Co., Reliable and Allegator, 50%; Reliable Cold Storage, 50%

Cronk &amp; Carrier Mfg. Co., No. 101

Richards' Bull Dog, Heavy, No. 125.....50¢@5¢

Richards' Trump, No. 127.....\$1.50

## Leaders, Cattle—

Small.....doz. 50¢; large, 60¢

Covert Mfg. Co.: Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%

## Leathers, Pump—

See Pumps—

## Lifters, Transom—

R. &amp; E.....10%

## Lines—

Wire Clothes, Nos. 18 19 20

100 feet.....\$2.50 2.25 2.00

75 feet.....\$2.10 1.90 1.65

Samson Cordage Works: Solid Braided Chalk, No. 0 to 3.....40¢

Solid Braided Masons'.....30¢

Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50

Masons' Lines, Shade Cord, &amp;c.: White Cotton, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50; Colors, No. 3½, \$1.75; No. 4, \$2.25; No. 4½, \$2.75

Linen, No. 3½, \$2.50; No. 4, \$3.50; No. 4½, \$4.50

Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50

Clothes Lines, White Cotton: 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75

100 ft., \$5.25.....20%

Turner &amp; Stanton Co.: Solid Braided Chalk, Masons' and Awning Lines.....40%

Clothes Lines, White Cotton.....20%

Shade Cord, Cotton or Linen.....20%

## Locks—Cabinet—

Cabinet Locks.....33½%

## Door Locks, Latches, &amp;c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co.....40%

R. &amp; E. Mfg. Co.....10%

## Padlocks—

R. &amp; E. Mfg. Co. Wrought Steel and Brass.....75¢@10¢

## Sash, &amp;c.—

Ives' Patent: Bronze and Brass, 55¢@5¢; Crescent, 60¢; Iron, 60¢; Window Ventilating, 40¢@20¢; Robinson Pat. Ventilating Sash Lock, 35¢

Pullman Patent Ventilating Lock, 25¢

Reading Sash Locks.....40%

## Machines—Boring—

Com. Up'r't, without Augers, \$2.00@2.25

Com. Ang'l'r, without Augers, \$2.25@2.50

Swan's Improved.....40¢@10¢

Jennings' Nos. 1 and 4.....25¢@7½¢

Miller's Falls.....5.75

Snell's, Upright, \$2.65; Angular, \$2.90

## Corking—

Reisinger Invincible Hand Power.....½ doz. \$48.00

## Fence—

Williams' Fence Machines.....each. \$5.50

## Hoisting—

Moore's Anti-Friction Chain Hoist, 30%

Moore's Hand Hoist, with Lock Brake.....20%

Moore's Cyclone High Speed Chain Hoist.....25%

## Ice Cutting—

Chandler's.....12½%

## Washing

Boss Washing Machine Co.: Per doz.

Boss No. 1.....\$57.00

Boss Rotary.....\$57.00

Champion Rotary Banner No. 1, \$57.00

Standard Champion No. 1.....\$50.00

Standard Perfection.....\$27.00

Cincinnati Square Western.....\$33.00

Uneda American, Round.....\$33.00

## Mallets—

Hickory.....45¢@50¢

Lignumvite.....45¢@50¢

Tinner's Hickory and Applewood.....doz. 45¢@50¢

## Mangers, Stable—

Sweet Iron Works.....50%

## Mats, Door—

Acme Flexible Steel.....50%

Elastic Steel (W. G. Co.), new list, 50%

## Mattocks—

See Picks and Mattocks.

## Milk Cans—See Cans, Milk.

## Mills, Coffee, &amp;c.—

Enterprise Mfg. Co.....20¢@25¢

National List Jan. 1, 1902.....30¢

Parker's Columbia and Victoria.....33½%

Parker's Box and Side.....50¢@10¢

Swift, Lane Bros. Co.....30%

## Motors, Water—

Divine's Red Devil.....30%

Lippincott's.....30%

## Mowers, Lawn—

NOTE.—Net prices are generally quoted

Cheapest, 10-in., \$2.00; advance

10¢ for each size.

Cheap, 10-in., \$2.25; advance 15¢

20¢ for each size.

Better Grade, 10-in., \$3.00; advance 25¢ for each size.

12 14 16 18-in.

High Grade.....\$1.50 4.75 5.00 5.25

Continental.....60%

Great American.....70%

Great American Ball B'r'g, new list, 70%

Quaker City.....70%

Pennsylvania.....60%

Pennsylvania, Jr., Ball Bearing, 50¢@10¢@5¢

Pennsylvania Golf.....50%

Pennsylvania Horse.....35¢@5¢

Pennsylvania Pony.....40¢@5¢

Granite State:

Style A, Low Wheel.....70%

Style B, Low Wheel.....70%

Style C, High Wheel, spl. list, 70¢@10¢

Style D, High Wheel, spl. list, 70%

Philadelphia:

Styles M., S. C. K., T.....70¢@10¢@5¢

Style A, all Steel.....70¢@10¢@5¢

Style E, High Wheel.....70¢@10¢@5¢

Drexel and Gold Coin, special list, 40%

Horse.....40¢@5¢

Pony.....40¢@5¢

36-in. Horse.....30¢@10¢

Eagle Horse.....30¢@5¢

I. X. L. Horse.....50%

## Nails—

Wire Nails and Brads, Miscellaneous.....85¢@85¢@10¢

Cut and Wire. See Trade Report.

Hungarian, Finishing, Upholsterers', &amp;c. See Tacks.

## Horse—

Nos. 6 7 8 9 10

Anchor.....23 21 20 19 18.....40¢@5¢

Coleman.....13 12 12 11 11.....net

New Haven.....23 21 20 19 18.....40¢@5¢

Livingston.....19 18 17 16 16.....10%

Western.....10%

Jobbers' Special Brands, per lb. 9¢@10¢

## Picture—

1½ 2 2½ 3 in.

Brass Hd. gro. 45 55 60 70

Por. Head, gro. 1.10 1.10 1.10



**Pinking Irons—**

See Irons, Pinking.

**Pins, Escutcheon—**

Brass ..... 50¢@50¢@10%  
 Iron, list Nov. 11, '85. 60¢@60¢@10%

**Pipe, Cast Iron Soil—**

Standard, 2-6 in. .... 60¢@50¢@10%  
 Extra Heavy, 2-6 in. .... 70¢@50¢@10%  
 Fittings, Standard and Heavy,  
 70¢@10¢@75%

**Pipe, Merchant—**

Consumers, Carloads, Steel.		Iron.	
Bk. Galv.	Bk. Galv.	Bk. Galv.	Bk. Galv.
1/2 and 1/4 in. 64	48	63	50
3/4 in. .... 68	52	64	50
1 in. .... 68	56	66	54
1 1/4 to 6 in. 72	62	70	60
7 to 12 in. 69	54	67	52

**Pipe, Vitrified Sewer—**

Carload lots.  
 Standard Pipe and Fittings, 3  
 to 24 in., f.o.b. factory:  
 First-class ..... 87%  
 Second-class ..... 90%

**Pipe, Stove—**

	Per 100 joints.	C. L. L. C. L.
Edwards' Nested:		
5 in., Standard Blue.....	\$6.25	7.25
6 in., Standard Blue.....	7.75	7.75
7 in., Standard Blue.....	7.75	8.75
8 in., Royal Blue.....	7.90	8.00
9 in., Royal Blue.....	7.50	8.50
10 in., Royal Blue.....	8.50	9.50
Wheeling Corrugating Co.'s Nested:		
5 in., Uniform Color.....	\$6.15	7.15
6 in., Uniform Color.....	6.65	7.65
7 in., Uniform Color.....	7.65	8.65

**Planes and Plane Irons—****Wood Planes—**

Bench, first qual. .... 30¢@30¢@10%  
 Bench, second qual. .... 40¢@40¢@10%  
 Molding ..... 25¢@25¢@10%  
 Chapin-Stephens Co.:  
 Bench, First Quality..... 30%  
 Bench, Second Quality..... 40%  
 Molding and Miscellaneous..... 25%  
 Toy and German..... 30%  
 Union ..... 60%

**Iron Planes—**

Chaplin's Iron Planes..... 50¢@10%  
 Union ..... 60%

**Plane Irons—**

Wood Bench Plane Irons, list  
 Dec. 12, '06. .... 25%  
 Buck Bros. .... 30%  
 Chapin-Stephens Co. .... 25%  
 Union ..... 50%  
 L. & J. White..... 20¢@25%

**Planters, Corn, Hand—**

Kohler's Eclipse..... 1/2 doz. \$8.00

**Plates—**

Felloy ..... 1 lb. 4¢@1/4¢

**Pliers and Nippers—**

Button Pliers..... 75¢@50¢@75¢@10¢@5%  
 Gas Burners, per doz., 5 in., \$1.25  
 @1.30; 6 in., \$1.45. \$1.50.  
 Gas Pipe..... 7 8 10 12 in.  
 \$2.00 \$2.25 \$2.75 \$3.50  
 Acme Nippers..... 50¢@5%  
 Cronk & Carrier Mfg. Co.:  
 American Button..... 80%  
 Improved Button..... 75¢@10%  
 Cronk's ..... 80%  
 No. 80 Linemen's..... 50%  
 Stub's Pattern..... 45%  
 Combination and others..... 35%  
 Heller's Farriers' Nippers, Pincers  
 and Tools..... 40¢@50¢@10¢@5%  
 P., S. & W. Timmers' Cutting Nip-  
 pers ..... 40%  
 Swedish Side, End and Diagonal  
 Cutting Pliers..... 50%  
 Utica Drop Forge & Tool Co.:  
 Pliers and Nippers, all kinds..... 40%

**Plumbs and Levels—**

Chapin-Stephens Co.:  
 Plumbs and Levels..... 30¢@30¢@10%  
 Chapin's Imp. Brass Cor. .... 40¢@40¢@10%  
 Pocket Levels..... 30¢@30¢@10%  
 Extension Sights..... 30¢@30¢@10%  
 Machinists' Levels..... 40¢@40¢@10%  
 Disston's Plumbs and Levels..... 60¢@10%  
 Disston's Pocket Levels..... 60¢@10%  
 Stanley's Duxley..... 35%  
 Woods' Extension..... 35%

**Points, Glaziers'—**

Bulk and 1-lb. papers..... 1 lb. 9 ¢  
 1/4-lb. papers..... 1 lb. 9 1/2 ¢  
 1/4-lb. papers..... 1 lb. 10 ¢

**Police Goods—**

Manufacturers' Lists..... 25¢@25¢@5%  
 Tower's ..... 25%

**Polish—Metal, Etc—**

Prestoline Liquid, No. 1 (1/4 pt.), 1/2  
 doz., \$3.00; No. 2 (1 qt.), \$0.00. 40%  
 Prestoline Paste..... 40%

George William Hoffman:  
 U. S. Metal Polish Paste, 3 oz.  
 boxes, 1/2 doz. 50¢; 1/2 doz. \$1.50;  
 1 lb boxes, 1/2 doz. \$2.25;  
 U. S. Liquid, 8 oz. cans, 1/2 doz.,  
 \$1.25.  
 Barkeepers' Friend Metal Polish, 1/2  
 doz., \$1.75.

**Stove—**

Black Eagle Benzine Paste, 5 lb cans,  
 1/2 doz. 10¢  
 Black Eagle, Liquid, 1/2 pt. cans,  
 1/2 doz. 75¢  
 Black Jack Paste, 1/2 lb cans, 1/2 gr. \$3.00  
 Black Kid Paste, 5 lb cans, each, \$0.65  
 Ladd's Black Beauty Liquid, per  
 100 tins..... \$5.75  
 Joseph Dixon, 1/2 gr. \$5.75..... 10%  
 Dixon's Plumbago..... 10%  
 Fireside ..... 10%  
 Gem, 1/2 gr. \$4.50..... 10%  
 Japanese ..... 10%  
 Jet Black ..... 10%  
 Peerless Iron Enamel, 10 oz. cans.,  
 1/2 doz. \$1.50

**Poppers, Corn—**

1 qt. Square. doz. \$0.80; gro. \$3.75  
 1 qt. Round. doz. \$0.90; gro. \$10.00  
 1 1/2 qt. Square. doz. \$1.00; gro. \$11.00  
 2 qt. Square. doz. \$1.25; gro. \$13.50

**Post Hole and Tree Au-  
gurs and Diggers—**

See also Diggers, Post Hole, etc.

**Posts, Steel—**

Steel Fence Posts, each, 5 ft., 42¢;  
 6 ft., 46¢; 6 1/2 ft., 48¢.  
 Steel Hitching Posts..... each \$1.30

**Potato Parers—**

See Parers, Potato.

**Pots, Glue—**

Enameled ..... 35¢@10%  
 Tinned ..... 30¢@10%

**Powder—**

In Canisters:  
 Duck, 1 lb. .... each 45¢  
 Fine Sporting, 1 lb. .... each 75¢  
 Rifle, 1/2 lb. .... each 15¢  
 Rifle, 1 lb. .... each 25¢  
 In Kegs:  
 12 1/2-lb. kegs ..... \$3.50  
 25-lb. kegs..... \$4.50  
 King's Semi-Smokeless:  
 Keg (25 lb bulk)..... \$5.50  
 Half Keg (12 1/2 lb bulk)..... \$3.50  
 Quarter Keg (6 1/4 lb bulk)..... \$1.90  
 Case 24 (1 lb cans bulk)..... \$2.50  
 Half case (1 lb cans bulk)..... \$4.50  
 King's Smokeless: Shot Gun, Rifle,  
 Keg (25 lb bulk)..... \$12.00 \$15.00  
 Half Keg (12 1/2 lb bulk)..... 6.25 7.75  
 Quarter Keg (6 1/4 lb bulk)..... 3.25 4.00  
 Case 24 (1 lb cans bulk)..... 14.00 17.00  
 Half case 12 (1 lb c. bk.)..... 7.25 8.75

**Presses—****Fruit and Jelly—**

Enterprise Mfg. Co..... 20¢@25%

**Seal Presses—**

Morrill's No. 1, 1/2 doz., \$20.00..... 50%

**Pruning Hooks and Shears**

See Shears.

**Pullers, Nail—**

Cyclops ..... 50%  
 Miller's Falls, No. 3, 1/2 doz., \$12.00.  
 33¢@10%  
 Morrill's No. 1, Nail Puller, 1/2 doz.  
 \$20.00 ..... 50%  
 Pearson No. 1, Cyclone Spike Puller,  
 each \$30.00..... 50%  
 The Scranton Co. Case Lots:  
 No. 2B (large)..... \$5.50  
 No. 3B (small)..... \$5.00  
 Smith & Hemenway Co.:  
 Diamond B..... 70%  
 Giant ..... 50%  
 Staple Pullers, Utica and Davi-  
 son ..... 60%

**Pulleys, Single Wheel—**

Inch ..... 1 1/2 1 3/4 2 3  
 Avoing or Tackle,  
 doz. \$0.50 .45 .60 1.06  
 Hay Fork, Sichel or Solid Eye,  
 doz., 4 in., \$1.25; 5 in., \$1.55  
 Inch ..... 2 1/4 2 1/2  
 Hot House, doz. \$0.65 .85 1.20  
 Inch ..... 1 1/4 1 3/4 2  
 Screw, doz. \$0.16 .19 .23 .30  
 Inch ..... 1 1/4 2 1/4 2 1/2  
 Side, doz. \$0.25 .40 .55 .60  
 Inch ..... 1 1/2 1 3/4 2 1/4

**Sash Pulleys—**

Common Frame; Square or  
 Round End, per doz., 1 1/4 and 2 in.  
 17¢@20¢  
 Auger Motion, no Face Plate,  
 per doz., 1 1/4 and 2 in. .... 20¢@21¢  
 Acme, No. 35, 1 1/4 in., 19¢; 2 in., 20¢  
 American Pulley Co.:  
 Wrought Steel American Plain  
 Axle ..... 50¢@10%  
 Wrought Steel, Eagle..... 17¢@20¢  
 Top Notch, Electrically Welded,  
 Nos. 3 and 4..... 19¢  
 Grand Rapids All Steel Noiseless..... 50%  
 Niagara, No. 35, 1 1/4 in., 19¢; 2  
 in. .... 20¢  
 No. 26 Troy, 1 1/4 in., 14¢; 2 in., 16¢  
 Star, No. 26, 1 1/4 in., 19¢; 2 in., 20¢  
 Tackle Blocks—See Blocks.

**Pumps—**

Cistern ..... 60%  
 Pitcher Spout..... 75¢@50¢@10%  
 Wood Pumps, Tubing, etc..... 50%  
 Barnes Dbl. Acting (low list)..... 40¢@5%

Barnes Pitcher Spout..... 75¢@10%  
 Contractors' Rubber Diaphragm, No.  
 2, B. & L. Block Co..... \$16.00  
 Daisy Spray Pump..... 1/2 doz. \$6.50  
 Flint & Walling's Fast Mail Hand  
 (low list) ..... 50%  
 Flint & Walling's Fast Mail (low  
 list) ..... 50%  
 Flint & Walling's Tight Top  
 Pitcher ..... 75¢@10%  
 National Specialty Mfg. Co., Measur-  
 ing, Nos. 2, \$6.00; 3, \$5.50..... 30%  
 Myers' Pumps (low list)..... 40¢@5%  
 Myers' Power Pumps..... 40¢@5%  
 Myers' Spray Pumps..... 40¢@5%

**Pump Leathers—**

Plunger and Valve Leathers—Per  
 gro.:  
 No. .... 1 2 3 4  
 \$5.00 6.00 7.00 8.00  
 Cup Leathers—Per 100:  
 Inch ..... 2 1/2 3 3 1/2 4  
 \$5.00 7.00 9.00 12.00

**Punches—**

Saddlers' or Drive, good,  
 doz. 50¢@75¢  
 Spring, single tube, good qual-  
 ity ..... \$1.75  
 Revolving (1/2 tubes) ..... doz. \$3.50  
 Bemis & Call Co.'s Cast St'l Drive..... 50%  
 Morrill's Nos. 1A, 1A, 1B, 1C,  
 1D, \$15.00..... 50%  
 Hercules 1 die, each \$5.00..... 50%  
 Niagara Hollow Punches..... 50%  
 Timmers' Hollow P., S. & W. Co., 40%  
 Timmers' Solid, P. S. & W. Co., 40%  
 doz., \$1.44..... 40%

**Rail—Barn Door, &c.—**

Sliding Door, Painted Iron,  
 2 1/2¢@2 3/4¢  
 Sliding Door, Wrought Brass,  
 1 1/2 in., 1 lb., 36¢ ..... 30%  
 Allith Mfg. Co.: Reliable Hanger  
 Track ..... 50%  
 Cronk's:  
 Double Braced Steel Rail, 1/2 ft. 3 1/4¢  
 O. N. T. Rail..... \$3.12  
 Griffin's:  
 100 ft., 1 x 3-16 in., \$3.25;  
 1 1/4 x 3-16 in., \$3.75.  
 Hinged Hanger, 100 ft., 1 x 3-16  
 in., \$3.50; 1 1/4 x 3-16 in., \$4.00.

Lane's:  
 Hinged Track, 100 ft. .... \$3.45  
 O. N. T., 100 ft., 1 in., \$3.00; 1 1/4  
 in., \$3.45; 1 1/2 in., \$4.00.  
 Standard, 1 1/4 in. .... 100 ft. \$4.00

Lawrence Bros.:  
 1 x 3-16 in., 100 ft., \$7.50; 1 1/4 x  
 3-16 in., \$8.75..... 55¢@75%

McKinney's:  
 Hinged Hanger Track, 1/2 ft., 11¢  
 1 x 3-16 Track..... 50¢@5%  
 Myers' Stayon Track..... 60¢@5%

Richards Mfg. Co.:  
 Common, 1 x 3-16 in., \$3.00; 1 1/4 x  
 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.  
 Special Hinged Hanger Rail, 60¢@10%  
 Lag Screw Rail, No. 65..... 50%  
 Gauge Trolley Track, 1/2 ft. No. 31,  
 9¢; No. 32, 14¢; No. 33, 20¢.  
 No. 50..... 60¢@10%  
 Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,  
 \$4.00; 65, \$3.25; 66, \$3.50; 67, No. 1,  
 \$3.25; 68, No. 2, \$3.50.

**Rakes—**

NOTE.—Many goods are sold  
 at net prices.  
 Fort Madison Red Head Lawn..... \$3.25  
 Fort Madison Blue Head Lawn..... \$2.71  
 Cronk's:  
 Steel Garden: Champion, 75%  
 Ideal, 80%; Victor..... 80¢@25%  
 Queen City Lawn, 1/2 doz., 20 teeth,  
 \$2.85; 24, \$3.00..... net  
 Anticlog Lawn, 1/2 doz..... \$4.00  
 Malleable Garden, 1/2 doz., 12 teeth,  
 \$15.00; 14, \$16.00; 16, \$18.00..... 80%  
 Kohler's:  
 Lawn Queen, 20-tooth..... 1/2 doz. \$3.15  
 Lawn Queen, 24-tooth..... 1/2 doz. \$3.25  
 Paragon, 20-tooth..... 1/2 doz. \$2.70  
 Paragon, 24-tooth..... 1/2 doz. \$2.75  
 Steel Garden, 14-tooth..... 1/2 doz. \$2.40  
 Malleable Garden, 14-tooth, 1/2 doz.  
 \$2.00@2.25

**Rasps, Horse—**

Diaston's ..... 75%  
 Heller Bros.' Gold Medal..... 70¢@70¢@10¢@5%  
 Liveright Bros.' Gold Medal..... 70¢@75%  
 McCaffrey's American Standard..... 60¢@10¢@5%  
 New Nicholson..... 70¢@10¢@75%  
 See also Files.

**Razors—**

Liana Bo-ras-ic..... 60%  
 Fox Razors, 1/2 doz., No. 42, \$20.00;  
 No. 44, \$20.00; No. 82, Platina..... 25%  
 \$25.00.  
 Red Devil..... 65%

**Reels, Fishing—**

Hendryx:  
 M 6, Q 6, A 6, B 6, M 9 1/4, M 16,  
 Q 16, A 16, B 16, 4008, Rubber  
 Popolo, Nickered Popolo..... 20%  
 Aluminum, German Silv., Bronze..... 20%  
 1240 N. 121 N. 121 N. 121 N. 121 N.  
 3004 N. 3004 N. 3004 N. 3004 N. 3004 N.  
 2904 P. 33 1/4; 2904 P. N. 33 1/4;  
 0924 N. 33 1/4; 02084 N. 33 1/4;  
 002904 P. N. 33 1/4; 802 N. 33 1/4;  
 986 P. N. 2904 N. 974 P. N. .... 25%  
 5009 P. N. 5009 N. .... 20%  
 Competitor, 102 P. 102 P. N. 202 P.  
 302 P. N. 302 P. N. 302 P. N. 302 P. N.  
 304 P. 304 P. N. 00304 P. 00304 P. N. 304 P.

**Registers—List July 1, 1903.**

Japanned, Electroplated and  
 Bronzed ..... 70%  
 White Porcelain Enamel..... 50¢@10%  
 Solid Brass or Bronze Metal..... 40%

**Revolvers—**

Single Action ..... 10¢@1.00  
 Double Action, except 1/4 cal. \$2.00  
 Double Action, 1/4 caliber..... \$2.00  
 Automatic ..... \$4.00  
 Hammerless ..... \$4.50

**Riddles, Hardware Grade**

16 in. .... per doz. \$2.50@2.75  
 17 in. .... per doz. \$2.75@3.00  
 18 in. .... per doz. \$3.00@3.25

**Rings and Ringers—****Bull Rings—**

Steel ..... \$0.70 0.75 0.80 doz.  
 Copper ..... \$1.10 1.25 1.65 doz.

**Hog Rings and Ringers—**

Hill's Rings, gro. boxes \$1.50@4.50  
 Hill's Ringers, Gray Iron, doz.,  
 60¢@75¢  
 Hill's Ringers, Malleable Iron,  
 doz. 80¢@95¢  
 Blair's Rings, per gro. \$5.00@5.50  
 Blair's Ringers, per doz. 75¢@90¢

**Rivets and Burrs—**

Copper ..... 50¢@50¢@5%  
 Carriage, Coopers', Timmers', etc.,  
 Black ..... 70¢@10%  
 Metallic Tinned..... 70%

**Bifurcated and Tubular—**

Assorted in Boxes.  
 Bifurcated, per doz. boxes, paste-  
 board boxes, 50 count, 29¢@25¢  
 Tin boxes, 100 count, 29¢@32¢.  
 Tubular, per doz. boxes, 50 count,  
 29¢@32¢; 100 count, 51¢@58¢.

**Rollers—**

Cronk's Stay, No. 50..... \$1.00  
 Cronk's Brinkerhoff No. 55, \$0.60;  
 No. 56, \$0.75; No. 60..... \$0.75  
 Lane's Stay..... 40%  
 Richards' Stay..... 40%  
 Handy Adj. and Reversible No. 33, 75¢  
 O. K. Adj. and Reversible No. 33, 75¢  
 Lag Screw, Nos. 55 and 57..... 50%  
 Underwriters', Nos. 59, 60..... 50%  
 Favorite, No. 54..... 60%

**Rope—**

Manila, 7-16 in. diam. and larger:  
 Pure ..... 1 lb. 10¢@10 1/2¢  
 Sisal, 7-16 in. diam. and larger:  
 Pure ..... 1 lb. 7 1/2¢@7 3/4¢  
 Sisal, 7-16 in. diam. and larger:  
 lower grade ..... 1 lb. 6 1/2¢@7¢  
 Sisal, Hay, Hide and Bale  
 Ropes, Medium and Coarse:  
 Mixed ..... 1 lb. 6 1/2¢@6 3/4¢  
 Pure ..... 1 lb. 7 1/2¢@7 3/4¢  
 Sisal, Tarred, Medium Lath  
 Yarn, Coarse and Untarred:  
 Mixed ..... 1 lb. 5¢@5 1/2¢  
 Pure ..... 1 lb. 6 1/2¢  
 Cotton Rope:  
 Best, 1/4 in. and larger..... 18¢@20¢  
 Medium, 1/4 in. and larger..... 16¢@17¢  
 Common, 1/4 in. and larger..... 10¢  
 In coils, 1/2¢ advance.  
 Jute Rope:  
 Thread, No. 1, 1/4 in. and up,  
 1 lb. .... 6 1/2¢  
 Thread, No. 2, 1/4 in. and up,  
 1 lb. .... 5 1/2¢

**Wire Rope—**

Galvanized ..... 37 1/2¢@2 1/4¢  
 Plain ..... 45¢@2 1/4¢

**Ropes, Hammock—**

Cover Mfg. Co.:  
 Jute, 35%; Sisal..... 20%

**Rules**

Boxwood ..... 60¢@60¢@10%  
 Ivory ..... 35¢@10¢@35¢@10¢@5%  
 Chapin-Stephens Co.:  
 Boxwood ..... 60%  
 Flexifold ..... 40%  
 Ivory ..... 25¢@25¢@10%  
 Miscellaneous ..... 50¢@50¢@10%  
 Stephens' Combination..... 55%  
 Stationers' ..... 50¢@50¢@10%  
 Kenfel & Esser Co.:  
 Folding, Wood..... 35¢@10%  
 Folding, Steel..... 35¢@10%  
 Lufkin's Steel..... 50¢@10%  
 Lufkin's Lumber..... 50¢@10%  
 Upon Nut Co.:  
 Boxwood ..... 60¢@60¢@10%  
 Ivory ..... 35¢@10¢@35¢@10¢@5%

**Sash Balances—**

See Balance, Sash.

**Sash Locks—See Locks, Sash.****Sash Weights—**

See Weights, Sash.

**Sausage Stuffers or Fillers**

See Stuffers or Fillers, Sausage.

**Saw Frames—**

See Frames, Saw.

**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.**

**Saws—**

Atkins:	
Circular	45%
Band	50@50&10
Butcher Saws	50
Cross Cuts	35
One-Man Cross Cut	40
Narrow Cross Cut	50
Hand, Rip and Panel	35&5
Miter Box and Compass	40
Mulay, Mill and Drag	45
Wood Saws	40&10
Chapin-Stephens Co.:	
Turning Saws and Frames	30@30&10
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws	30&10&10
Diston's:	
Circular, Solid and Ins'ted Tooth	50
Band, 2 to 18 in. wide	60
Band, 4 to 14	60
Crosscuts	45
Narrow Crosscuts	50
Mulay, Mill and Drag	50
Framed Woodsaws	25
Woodsaw Blades	25
Woodsaw Rods Tinned	15
Hand Saws, Nos. 12, 99, 4, 16, d100	25
D8, 120, 76, 77, 8	25
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1	25
0, 00, Combination	30
Compass, Key Hole, &c.	25
Butcher Saws and Blades	30
C. E. Jennings & Co.'s:	
Back Saws	16%
Butcher Saws	75
Compass and Key Hole Saws	33 1/2
Framed Wood Saws	25 1/2
Hand Saws	12 1/2
Wood Saw Blades	33 1/2

Millers Falls:	
Butcher Saws	15&10
Star Saw Blades	15&10
Massachusetts Saw Works:	
Victor Kitchen Saws	40&10&50
Butcher Saws	35&40
Peace & Richardson's Hand Saws	30
Simonds:	
Circular Saws	45
Crescent Ground Cross Cut Saws	30
One-Man Cross Cuts	40&10
Gang Mill, Mulay and Drag Saws	45
Band Saws	50
Back Saws	25@25&7 1/2
Butcher Saws	35@35&7 1/2
Hand Saws	25@25&7 1/2
Hand Saws, Bay State Brand	45
Compass, Key Hole, &c.	25@25&7 1/2
Wood Saws	40&7 1/2
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws	50

**Hack Saw Blades and Frames—**

Atkins' Hack Saw Blades A A A	25
Diston's:	
Concave Blades	25
Keystone Blades	35
Hack Saw Frames	50
Simonds File Co.	35
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180	40&7 1/2
Hack Saws, Nos. 175, 180, complete	40&7 1/2
Goodell's Hack Saw Blades	40&10
Griffin's Hack Saw Frames	35&5&10
Griffin's Hack Saw Blades	35&5&10
Star Hack Saws and Blades	15&10
Sterling Hack Saw Blades	30&10&5
Sterling Hack Saw Frames	30&10&10
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00	10
Victor Hack Saw Blades	20
Victor Hack Saw Frames	40
Whitaker Mfg. Co.:	
National Hand Blades	40
National Hand Frames	30&5
National Power Blades	30&10

**Scroll—**

Barnes, No. 7, \$15	25
Barnes' Scroll Saw Blades	40
Barnes' Velocipede Power Scroll Saw, without box or attachment	50
with boring attachment, \$30	20
Lester, complete, \$10.00	15&10
Rogers, complete, \$3.50 and \$4.00	15&10

**Scales—**

Union Platform, Plain	\$2.10 @ 2.20
Union Platform, Stpd.	\$2.20 @ 2.30
Chatillon's:	
Eureka	25
Favorite	40
Grocers' Trip Scales	50
The Standard Portables	40
The Standard R. R. and Wag-	50&10

**Scrapers—**

Box, 1 Handle	doz \$2.00 @ 2.25
Box, 2 Handle	doz \$2.50 @ 2.60
Ship...Light, \$2.00; Heavy, \$1.50	
Chapin-Stephens Co., Box, 30@30&10	
Richards Mfg. Co., Foot	60

**Screws—Bench and Hand**

Bench, Iron, doz., 1 in., \$2.50 @ 2.75; 1 1/2, \$1.00 @ 1.25; 1 3/4, \$1.50 @ 1.75	
Bench, Wood	20@20&10
Hand, Wood	70&10@70&10&10
Chapin-Stephens Co., Hand	70&10@70&10&2 1/2

**Coach, Lag and Hand Rail**

Lag, Cone Point	80&5 @ 80&10
Coach, Gimlet Point	80 @ 80&5
Hand Rail	70&10 @ 75

**Jack Screws—**

Standard List	70&10 @ 75
Millers Falls	50&10 @ 10
Swett Iron Works	70&75

**Machine—**

Cut Tread, Iron, Brass or Bronze:	
Flat Head or Round Head	50&50 @ 10
Fillister Head	40 @ 40&10

Rolled Thread, F. H. or R. H., Iron 75&10  
F. H. or R. H., Brass, Nos. 8 to 14 65&10

**Set and Cap—**

Set (Iron)	75&10&7 1/2
Set (Steel), net advance over Iron	25
Sq. Hd. Cap	70&10&7 1/2
Hex. Hd. Cap	70&10&7 1/2
Rd. Hd. Cap	50&7 1/2
Fillister Hd. Cap	60&7 1/2

**Wood—**

List July 23, 1903.	
Flat Head, Iron	87 1/2 @ 50
Round Head, Iron	85 @ 50
Flat Head, Brass	80 @ 50
Round Head, Brass	77 1/2 @ 50
Flat Head, Bronze	75 @ 50
Round Head, Bronze	72 1/2 @ 50
Drive Screws	87 1/2 @ 50

**Scroll Saws—**

See Saws, Scroll.

**Scythes—**

Grass, No. 1, Plain	per doz. \$7.00 @ 7.50
Clipper, Bronzed Webb	\$7.25 @ 7.75
No. 3 Clipper, Pol'd Webb	7.50 @ 8.00
No. 6 Clipper and Solid Steel	7.75 @ 8.25
Bush, Weed and Bramble, Nos. 11, 12 and 13	\$7.25 @ 7.75
Grain, No. 1	\$9.00 @ 9.50
Bronzed Webb, No. 1	\$9.25 @ 9.75
Nos. 3 and 4 Clipper, Grain	\$9.50 @ 10.00
Solid Steel, No. 6	\$10.00 @ 10.50

**Seeders, Raisin—**

Enterprise	25 @ 30
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**Sets—Awl and Tool—**

Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$16; 3, \$12	50
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18	20&10

**Garden Tool Sets—**

Ft. Madison Three Plows, Hoe, Rake and Shovel	per doz. sets \$9.00
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**Sets, Nail—**

Octagon	per doz. \$3.50 @ 3.75
Buck Bros.	27 1/2
Cannon's Diamond Point	per doz. \$12.00 @ 10
Mayhew's	per doz. \$9.00
Snell's Corrugated, Cup Pt.	40&10
Snell's Knurled, Cup Pt.	40&10
Victor Knurled, Cup Pt.	per doz. \$7.50

**Rivet—**

Regular list	75 @ 75&10
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**Saw—**

Atkins:	
Criterion	40
Adjustable	40
Diston's Star, Monarch and Triumph	30
Morrill's No. 1	\$15.00
Nos. 3 and 4, Cross Cut	\$20.00
No. 5, Mill	\$30.00
No. 10, 11	\$35.00
No. 1 Old Style	\$10.00
Special	\$16.25
Giant Royal Cross Cut	per doz. \$8.00
Royal, Hand	per doz. \$4.50
Taintor Positive	per doz. \$6.75

**Shaving—**

Fox Shaving Sets, No. 30	per doz., net, \$24.00
Smith & Hemenway Co.'s	75

**Sharpeners, Knife—**

Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	per doz. \$1.50
Mounted Kitchen Sand Stone	per doz. \$1.50
Natural Grit Carving Knife Hones	per doz. \$3.00
Quick Cut Emery Carving Knife Hones	per doz. \$1.50
Quick Edge Pocket Knife Hones	per doz. \$2.50

**Skate—**

Smith & Hemenway Co., Eureka	50
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**Shaves, Spoke—**

Iron	doz. \$1.25
Wood	doz. \$2.00
Bailey's (Stanley R. & L. Co.)	45
Chapin-Stephens Co.	30@30&10
Goodell's	per doz. \$9.00 @ 15&10

**Shears—**

Cast Iron. 7 8 9 in.	
Best	\$16.00 18.00 20.00 gro.
Good	\$13.00 15.00 17.00 gro.
Cheap	\$5.00 6.00 7.00 gro.

**Straight Trimmers, &c.**

Best quality Jap.	70 @ 70&10
Best quality Nickel	60 @ 60&10
Tailors' Shears	40 @ 40&10
Acme Cast Shears	40 @ 40&5
Heinisch's Tailor's Shears	10
Wilkinson Shear & Cutlery Co.:	
Sheep, 1900 list	30 @ 30&5
Grass	50 @ 10
Horse or Mule	50 @ 10
J. Wiss & Sons Co.:	
Best Quality Jap'd	60 @ 10
Best Quality Nickeld	50 @ 10
Tailors'	25

**Tinners' Snips—**

Steel Blades	20 @ 20&10
Steel Laid Blades	40 @ 40&10

Forged Handles, Steel Blades, Berlin 50  
Heinisch's Snips 40  
Jennings & Griffin Mfg. Co.'s 6% to 10 in. 33 1/2 @ 7 1/2  
Niagara Snips 40  
P. S. & W. Forged Handles, 25%  
W. R. W. 40 @ 10  
J. Wiss & Sons Co. 25  
Wiss Forged Steel 25

**Pruning Shears—**

Cronk's Hand Shears	33 1/2
Cronk's Wood Handle Shears	33 1/2
Diston's Combined Pruning Hook and Saw, per doz.	\$18.00 @ 25
Diston's Pruning Hook only, per doz.	\$12.00 @ 25
John T. Henry Mfg. Co.:	
Pruning Shears, all grades	40
P. S. & W. Co.	40 @ 10
Columbian Cutlery Co.:	
Hedge, Wilcut Brand	60 @ 10
Lawn and Border, Wilcut Brand	60 @ 10

**Sheaves—Sliding Door—**

Reading	40
R. & E. list	15

**Sliding Shutter—**

Reading list	40
R. & E. list	10

**Shells—Shells, Empty—**

Brass Shells, Empty:	
Climax, 10 and 12 gauge	65 @ 10
Club, Rival, 65&5; First Quality	60 @ 5

**Paper Shells, Empty:**

New Rapid, 10, 12, 16 and 20 gauge	25 @ 10
Climax, 10 and 12 gauge; Acme, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge; Leader grade	25 @ 5

**Union League, 12 and 12 gauge:**

Rival Grade	25
New Climax, Defiance 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge; Monarch, 10, 12, 14 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade	20

**Shells, Loaded—**

Loaded with Black Powder	40
Loaded with Smokeless Powder, medium grade	40 @ 5
Loaded with Smokeless Powder, high grade	40 @ 10 & 10
Union Metallic Cartridge Co.:	
New Club, Black Powders	40
Nitro Club, Smokeless Powders	40 @ 5
Arrow, Smokeless Powders	40 @ 10 & 10
Winchester:	
Smokeless Repeater Grade	40 @ 5
Smokeless Leader Grade	40 @ 10 & 10
Black Powder	40

**Shingles, Metal—Per Sq.**

Edwards Mfg. Co.:	
Painted	
14 x 20	\$4.25
10 x 14	4.50
7 x 10	4.75
Galv.	
14 x 20	6.00
10 x 14	6.25
7 x 10	6.50
Wheeling Corrugating Co.:	
Dixie, 14 x 20 in.	\$4.25
Dixie, 10 x 14 in.	4.50
Dixie, 7 x 10 in.	5.00

**Shoes, Horse, Mule, &c.—**

E.o.b. Pittsburgh:	
Iron	per keg \$4.10
Steel	per keg \$3.85
Burden's all sizes	per keg \$3.90

**Shot—**

Drop, up to B	25-lb. bag. \$1.85
Drop, B and larger	2.10
Buck	2.10
Chilled	2.10
Dust	2.30

**Shovels and Spades—**

Association List, Nov. 15, 1902	40
Avery Stamping Co.	40

**Snow Shovels—**

Long Handle	\$3.25 @ \$3.50
Wood and Mail, D Handle	\$3.75 @ \$4.00

**Sieves and Sifters—**

Hunter's Imitation	per doz. \$9.50 @ 10.00
Hunter's Genuine	per doz. \$12.00 @ 12.50

**Sifters, Ash—**

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each	\$3.25
per doz.	\$39.00

**Sieves, Seamless Metallic**

Per dozen.	
Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.30

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch	
Mesh 18, Nested	per doz. \$9.90 @ 10.95
Mesh 20, Nested	per doz. \$1.00 @ 1.05
Mesh 24, Nested	per doz. \$1.30 @ 1.40

**Sinks, Cast Iron—**

Painted, Standard list:	
12 x 12 to 22 x 36 in.	60
20 x 24 to 24 x 50 in.	50
24 x 60 to 24 x 120 in.	30
Barnes' low list:	
Up to and including 20 x 36 in.	50 @ 5
20 x 40 to 24 x 50 in.	45

NOTE.—There is not entire uniformity in lists used by jobbers.

**Skins, Wagon—**

Cast Iron	70 @ 75 @ 10
Steel	40 @ 45

**Slates, School—**

Factory Shipments.	
"D" Slates	50 @ 50 & 10
Eureka, Uneexcelled Noisless	60 @ 5 tens
Victor A, Noiseless	60 @ 5 tens @ 5

**Slaw Cutters—See Cutters.****Snaps, Harness—**

German	40 @ 40 & 10
Covert Mfg. Co.:	
Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&25	
High Grade, 40%; Trojan	40
Jockey	25

**Snaths—**

Scythe	55 @ 60
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**Snips, Tinner's—See Shears.****Spoons and Forks—****Silver Plated—**

Good Quality	50 @ 10 @ 60 @ 5
Cheap	60 @ 60 & 10
International Silver Co.:	
1847 Rogers Bros., 40&10%; Rogers & Hamilton	50 @ 10
Rogers & Bro., William Rogers	50 @ 10
Eagle Brand	50 @ 10
Anchor, Rogers Brand	60
Wm. Rogers & Son	60 @ 10

**Miscellaneous**



For the Table of "Current Metal Prices" see the First Issue of Every Month.

